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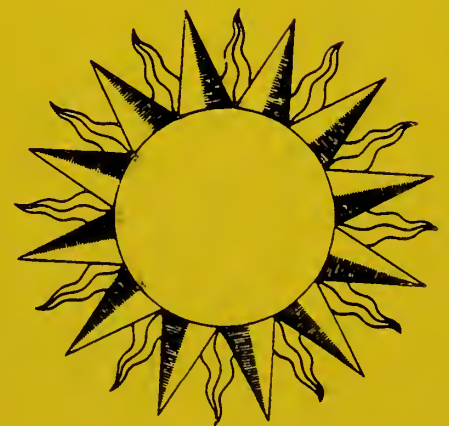
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Residential Solar Data Center: Data Dictionary/Directory

U.S. DEPARTMENT OF COMMERCE
National Bureau of Standards
Center for Building Technology
Building Economics and Regulatory
Technology Division
Washington, DC 20234

August 1981



Prepared for:
U.S. Department of Housing and Urban Development
Division of Energy, Building Technology and Standards
Washington, DC 20410

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**RESIDENTIAL SOLAR DATA CENTER:
DATA DICTIONARY/DIRECTORY**

Patricia M. Christopher

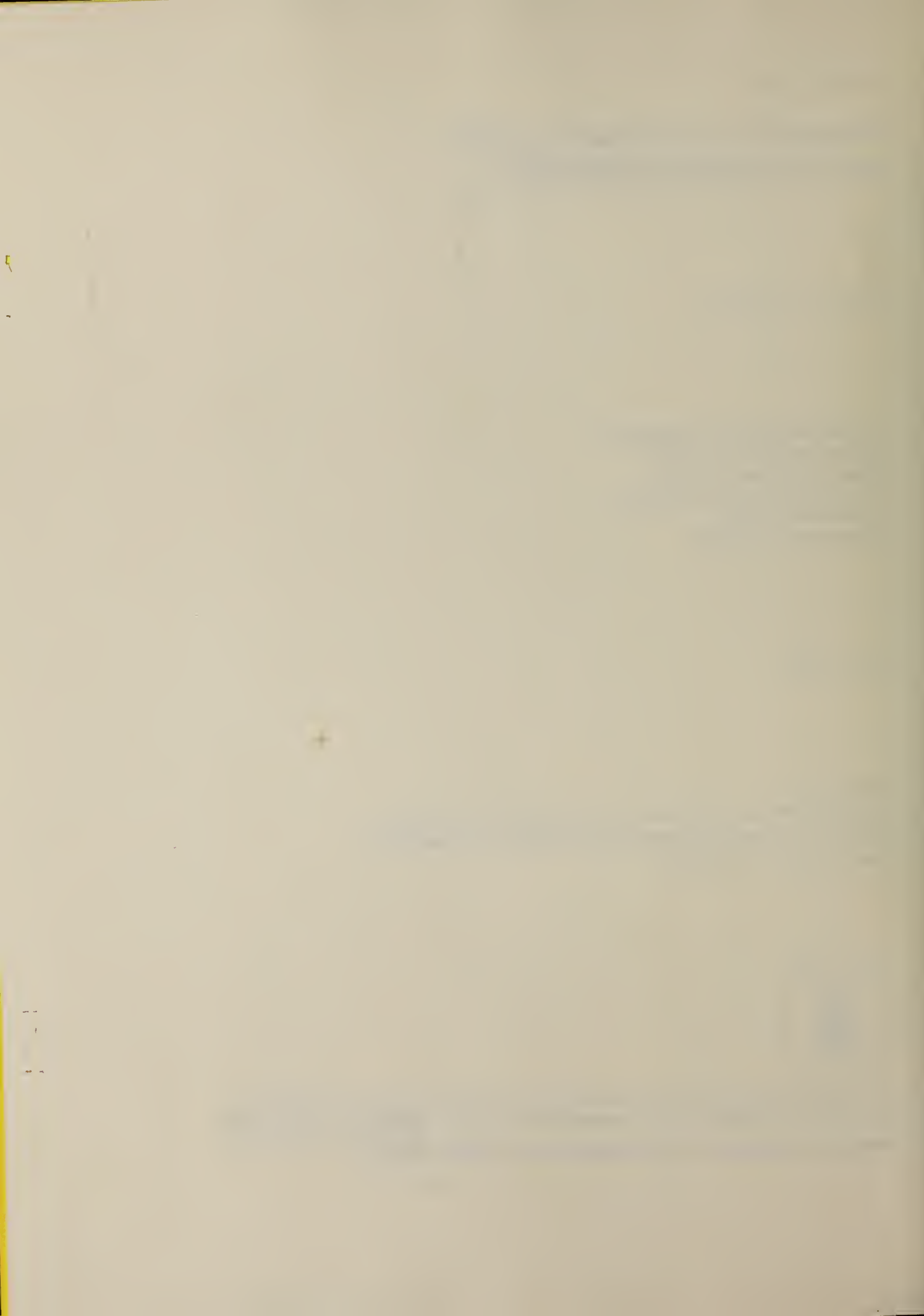
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U.S. DEPARTMENT OF COMMERCE, Malcolm Baldrige, *Secretary*
NATIONAL BUREAU OF STANDARDS, Ernest Ambler, *Director*



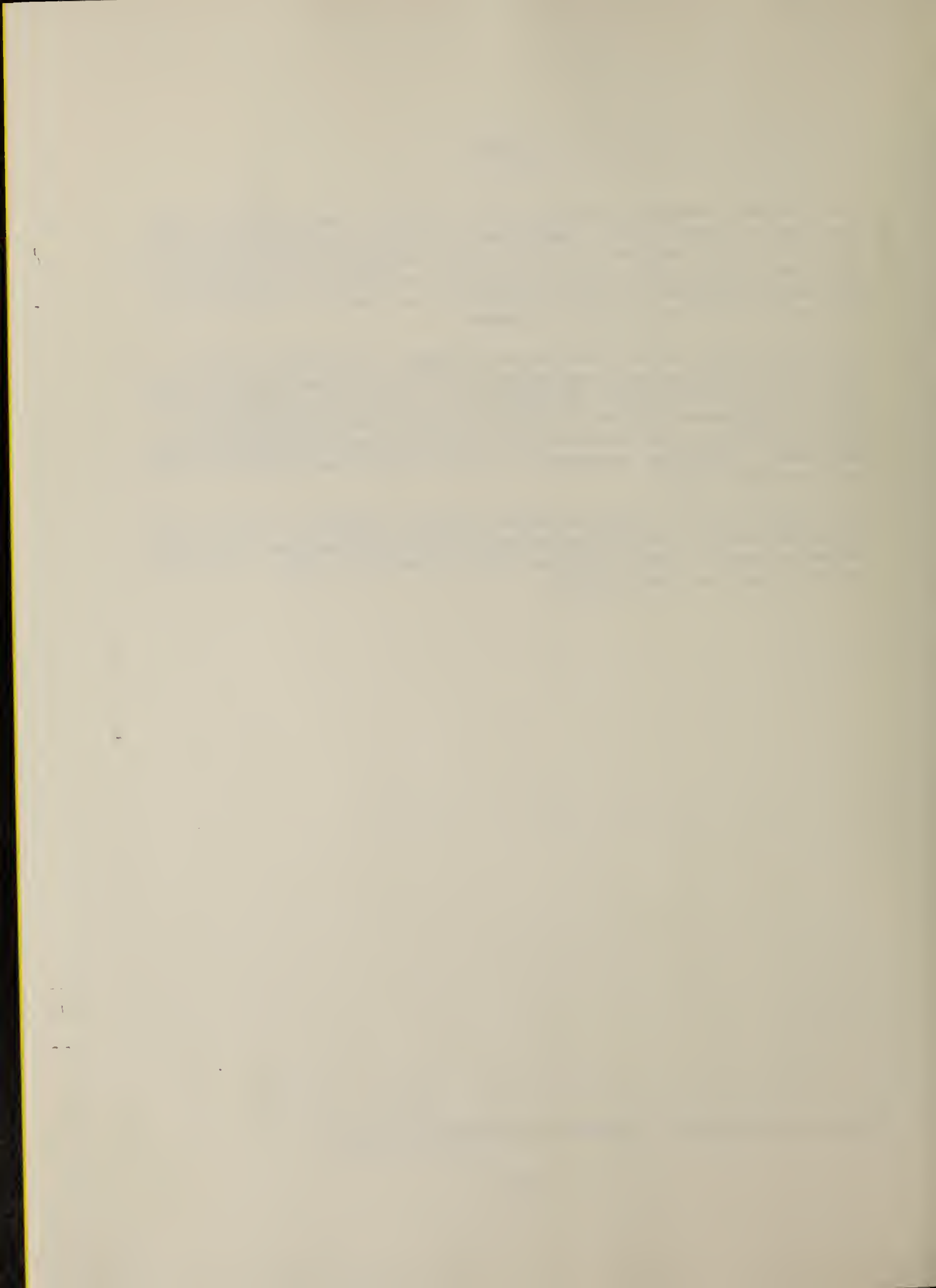
PREFACE

This document describes and defines the individual data elements which have been collected into a computerized data base, managed and operated by the NBS Solar Data Center (SDC) for the Department of Housing and Urban Development (HUD). It is being made available to document the data which have been collected by HUD over the last four years in the Residential Solar Demonstration Program.

This is not meant to be a stand-alone document. It should be used along with Data Resources and Reports [8]* and the final computer listings of the SDC files [9]. The former publication summarizes the history and background of the SDC, gives a list of the final computer reports available, and describes the data files which comprise the SDC data base. The latter reference is to the final computer reports which use these data files.

It is hoped that the three documents will work together to give the uninitiated user a clear picture of the data being documented. The three documents together form a package which is the final report to HUD of the four-year data base project.

*Numbers in brackets [] refer to references on page 94.

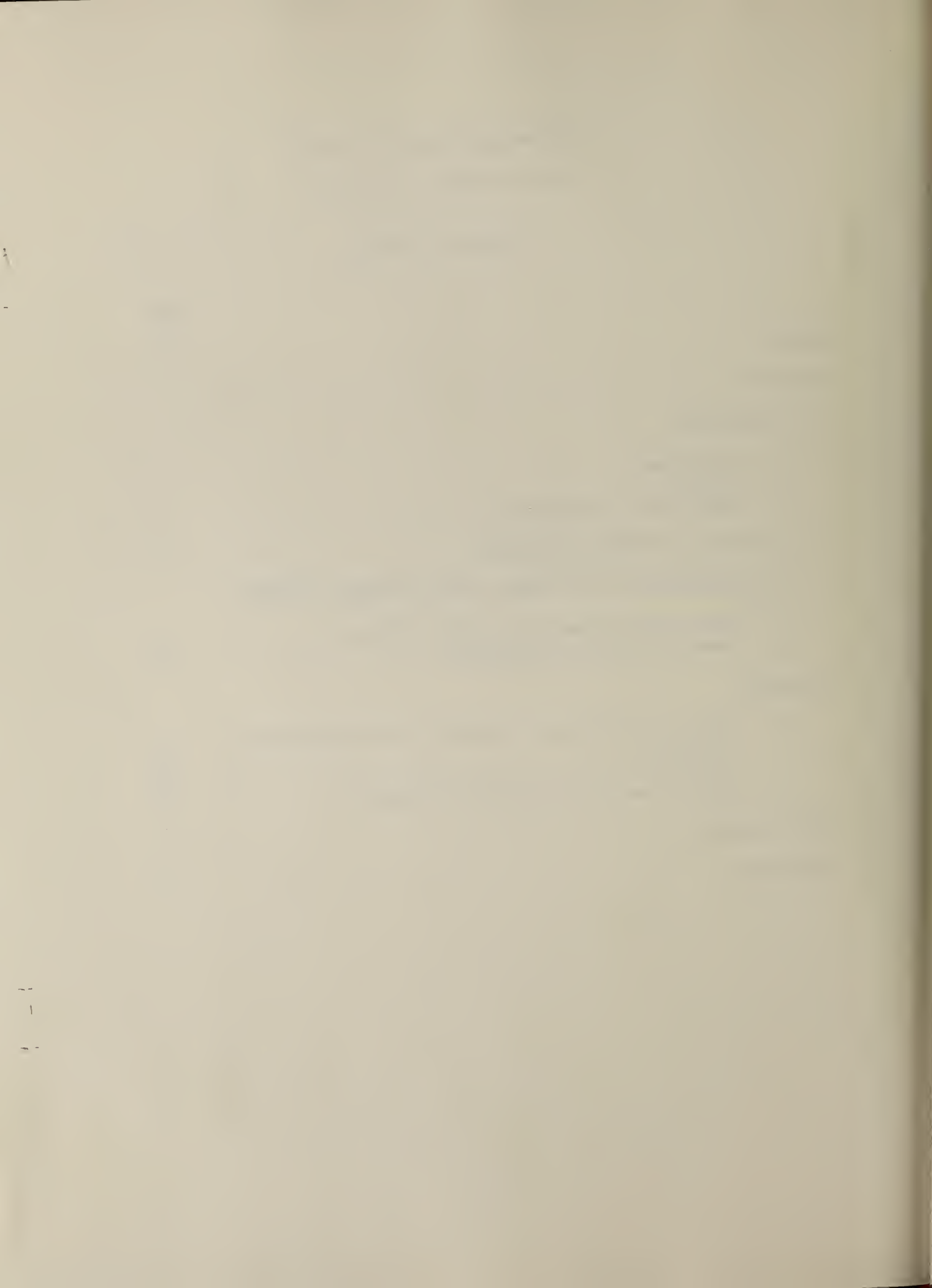


Residential Solar Data Center :

Data Dictionary/Directory

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RESIDENTIAL SOLAR DATA CENTER:

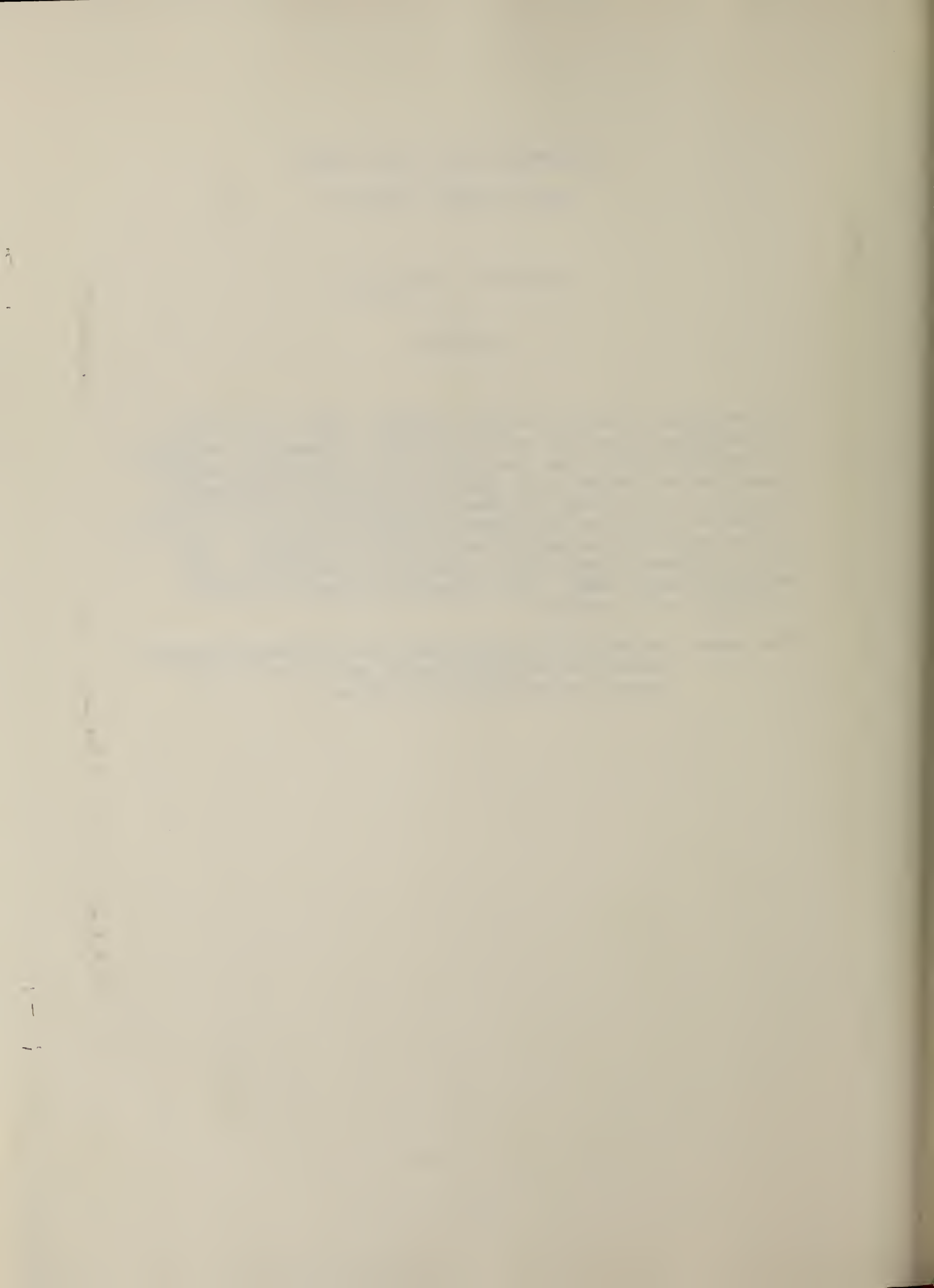
DATA DICTIONARY/DIRECTORY

Patricia M. Christopher

ABSTRACT

The Residential Solar Data Center project staff in the Center for Building Technology, National Bureau of Standards, maintains a computerized data base containing non-instrumented residential data from the DoE/HUD Solar Heating and Cooling Demonstration Program. This document provides a dictionary of data elements collected as part of the Residential Solar Program and a directory of the specific files which contain the data elements. This data dictionary/directory was produced by a computer program written in ASCII COBOL. The automated procedure is briefly described in an appendix.

Key Words: Automatic data processing; data dictionary/directory; residential buildings; solar data; solar energy system; solar heating and cooling.



1. INTRODUCTION

1.1 Background

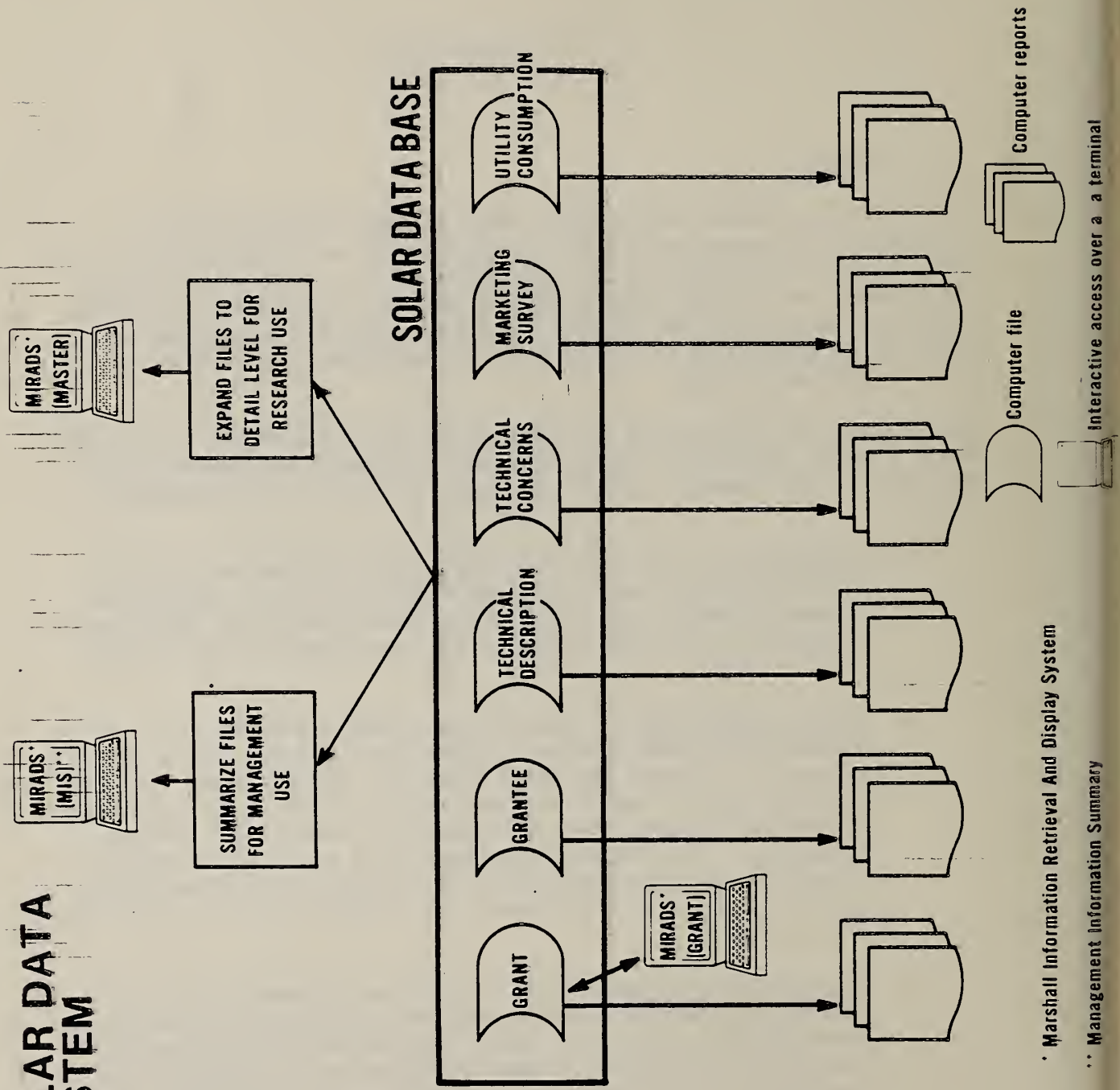
The Residential Solar Data Center (SDC) of the National Bureau of Standards is responsible for the establishment and operation of an automated data base containing non-instrumented (i.e., not collected by instruments but through interviews and forms), residential solar data collected as part of the Residential Solar Heating and Cooling Demonstration Program which is managed by the Department of Housing and Urban Development (HUD).

Data collection contractors to HUD collect and forward data to the SDC where a solar data base (shown in figure 1, page 2) is stored on the NBS Univac 1108 computer. This data base consists of the following files:

- a. Grant File: This file contains basic information about the building project and the solar systems for each application funded by HUD. These data are derived from grant applications submitted to HUD and updated with information from periodic field reports.
- b. Grantee Report File: Data in this file are based upon reports submitted by each grantee (the builder/designer who is awarded a grant) to Boeing Aerospace Company. These reports describe the progress of the grant from design and award of construction financing through actual construction, sale, and permanent financing. The grantee's perception of the ease or difficulty of obtaining financing, and/or obtaining building and zoning approval, as well as problems with construction or installation, are included.
- c. Technical Description File: This file contains basic system design and predicted performance data collected for HUD by Dubin-Bloome Associates from a large number of selected non-instrumented systems. A more detailed set of data was collected for HUD by the American Institute of Architects/Research Corporation for those systems which are instrumented.
- d. Technical Concerns File: Contained in this file are data on problems found during the design, construction, or operational phase which were recorded in field activity reports submitted by Dubin-Bloome and Boeing field representatives. Also contained are data on problems found after construction, as recorded by the grantee.

SOLAR DATA SYSTEM

Figure 1:



* Marshall Information Retrieval And Display System

** Management Information Summary

- e. Marketing Survey File: This file contains extensive survey questionnaire results collected for HUD by the Real Estate Research Corporation from selected builders, lenders, homebuyers, code officials, utility companies, and other market participants. The data sample includes representatives of those who chose to build, lend, or buy a funded solar house and "comparatives" who did not become involved. Data are also collected after the sale to gauge builder and consumer reactions over a period of time.
- f. Utility Consumption File: This file contains information on auxiliary or "back-up" fuel consumed for selected solar projects. The data are collected from utility companies (with purchaser agreement). "Comparative" data are also collected (i.e., utility bills for similar but non-solar homes).

A series of computer reports (shown in figure 1, page 2) produced from the solar data base are available to solar researchers.*

Some of the data base files are available interactively (i.e., with interaction by the data base user over a computer terminal). This means of access is described in [4].

1.2 Purpose

This publication has been compiled to document the data which have been collected by HUD and their contractors over the last four years in the Residential Solar Demonstration Program. Its anticipated use is by solar researchers, the public sector, and participants in the demonstration program. The average user is expected to be unfamiliar with the data base of the Demonstration Program. Therefore, this document should be used along with [8] and [9]. The latter documents will provide the additional information on the data base and its contents.

Another purpose of this publication is to document the data dictionary format and briefly described the computer process used to produce this format.

1.3 Organization and Approach

The data dictionary shown in section 2 orders the data into five major categories: technical, marketing, financial, institutional/legal, and miscellaneous. Other publications on the residential solar data [2, 3, 4, 8, 9] refer to data elements by the data base files which contain them. It was felt that the major use of this dictionary would be by people with no knowledge of the computer files but with knowledge of solar technology. Therefore, this dictionary is organized by categories and subcategories pertaining to solar technology and a cross reference list (page 42) is organized by computer file names.

*References [2] and [3] describe these reports in detail and explain how to obtain copies of the individual reports.

There are two cross reference lists to the dictionary included in section 3. They are meant to be used for browsing. The first is in the same order as the dictionary/directory of section 2 and includes the category and subcategory headings, data element name, and reference to the page number of the complete entry in the dictionary. The other is organized by the computer files associated with data elements and includes the file name, data element name, and page number of the complete entry in the dictionary.

2. SOLAR DATA DICTIONARY/DIRECTORY

The data in this dictionary/directory are organized first into one of five categories (technical, marketing, financial, institutional/legal, and miscellaneous). Within each category, the data are organized into subcategories (such as: auxiliary energy, construction information, design, loads, etc.). Each entry under a subcategory contains up to seven items of information to describe and define each data element.

- o Data Element Name - The name associated with this item of data.
- o Level - Data elements are collected at one of five levels: Grant (G), Location (L), Building (B), Unit (U), and System (S).

It is important to know the level of each data element since a single grant may include several buildings, *i.e.* a piece of data about such a grant may occur once (if it is grant level data) or several times (if it is building level data). A single building may include several units (such as an apartment building) and/or systems. A single system may serve more than one building and/or unit. Knowing the level at which the data elements are collected can alert the user to the possibility of multiple occurrences of the data in some of the computer file listings of [9].

- o Units - Units or terms of measurement. For example \$ (dollars), MMBTUs (10^6 Btu), % (percent).
- o File - The name of the file in which the data element is located. In some cases, the element is listed in more than one file. The file abbreviations are:

- HA - Grant File
- BA - Grantee Report #1
- BB - Grantee Report #3
- BC - Grantee Report #4
- FC - Technical Description File
- BF - Utility Consumption File
- CB - Technical Concerns File

The nature and scope of the various data files within the data base are explained in Data Resources and Reports [2].

- o Codes/Values - Mneumonic codes, with their values, pertaining to the data element. For example, the codes for collector type are: AT = ATtic, CON = CONcentrating, EV = EVacuated tube, and FL = FLat plate. These codes specify all types of collectors that are currently in the data base. If the list of codes/values is too long to be included in the table, it is included in appendix C.

- o Data Element MIRADS Name - The name by which the data element is referenced through MIRADS, the interactive interface to the data base. For more information, see [4].
- o Definition - An explanation of what the data element is. Many of the terms used in the definitions are defined in the glossary of appendix B.

LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
S	BTU/HR	FC		AUXCAP	THE AMOUNT OF HEAT WHICH CAN BE SUPPLIED BY THE AUXILIARY (BACK UP) SYSTEM.
S	PERCENT	FC	75= GAS 65= OIL 99= ELEC 00= 100% ELEC	AUXEFF	THE COMBINED EFFICIENCY (SEASONAL) OF THE AUXILIARY (BACK UP) SYSTEM.
U		BF	E= ELECTRIC O= OIL C= GAS W= WOOD P= PROPANE T= OTHER	AUXTYPE	THE TYPE OF ENERGY USED AS A BACKUP ENERGY SOURCE FOR THE SOLAR SYSTEM.
S		BB		AUXOTH-RPT3 AUXTYPE-RPT3	THE TYPE OF ENERGY USED AS A BACKUP ENERGY SOURCE FOR THE SOLAR SYSTEM - AS REPORTED IN GRANTEE REPORT 3.
S		FC	CA= GAS OI= OIL EL= ELECTRIC CO= COAL OT= OTHER	AUXCOOL AUXDIHW AUXHEAT	THE AUXILIARY (BACK UP) FUEL (GAS, OIL, ELECTRICITY ETC.) USED FOR THE COOLING OR DOMESTIC HOT WATER OR HEATING SYSTEM (WHEN SOLAR-ASSISTED ENERGY IS NOT AVAILABLE).
U		BF	M= MONTHLY E= EVERY OTHER MONTH Q= QUARTERLY S= SEMI-ANNUALLY A= ANNUALLY I= IRREGULARLY X= NO LONGER PROVIDED C= COMP. UNIT SOLD	AUXFREQ	THE FREQUENCY WITH WHICH UTILITY BILLS ARE SUBMITTED FOR DATA ENTRY BY THE UTILITY COMPANY.
U		BF		COMPNO	A SEQUENCE IDENTIFICATION (A-Z) GIVEN TO UNITS OR BUILDINGS FOR WHICH "COMPARATIVE DATA IS COLLECTED. "COMPARATIVE" DATA IS COLLECTED FOR NON-SOLAR UNITS (OR BUILDINGS) IN THE SAME NEIGHBORHOOD WHICH ARE SIMILAR TO SOLAR UNITS (OR BUILDINGS).
U		BF		AUXDESNO	A SEQUENCE NUMBER (1-99) CALLED THE

I. TECHNICAL SECTION
A. AUXILIARY ENERGY

BACKUP CAPACITY

BACKUP EFFICIENCY

BACKUP ENERGY TYPE

BACKUP ENERGY TYPE - GRANTEE RPT3

BACKUP ENERGY TYPE - TECH DESC

BILLING FREQUENCY

COMPARATIVE IDENTIFICATION

DESIGNATOR NO (UNIT OR BUILDING)

I. TECHNICAL SECTION A. AUXILIARY ENERGY	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
END OF BILLING PERIOD	U	MO/DAY/YR	BF		AUXENDDATE	DESIGNATOR NUMBER WHICH IS GIVEN TO ALL UNITS (FOR SINGLE-FAMILY HOMES) OR BUILDINGS (FOR MULTI-FAMILY HOMES) OF A GRANT.
ENERGY CONSUMED	U	RE AUXUNITS	BF		AUXCONSUMED	THE FINAL DAY OF THE PERIOD OVER WHICH ENERGY CONSUMPTION IS MEASURED.
ENERGY COST	U	\$	BF		AUXCOST	DIFFERENCE BETWEEN PRESENT METER READING AND PREVIOUS METER READING.
ENERGY SUPPLIED PER NON SOLAR SYSTEM	S	MBTU	HA		SYSTEMTAUX	THE COST FOR THE ENERGY USED DURING THE PAST ENERGY CONSUMPTION PERIOD.
METER NUMBER	U		BF		AUXMETER	PREDICTED ANNUAL, NON-SOLAR ENERGY DELIVERED BY BACKUP SYSTEM.
PRESENT METER READING	U		BF		AUXSTMETER	A NUMBER (1-9) WHICH IS USED ONLY IF THERE IS MORE THAN ONE METER FOR THE SAME TYPE OF ENERGY.
PREVIOUS METER READING	U		BF		AUXENDMETER	NUMERICAL READING ON METER AT END OF PREVIOUS (START OF PRESENT) ENERGY CONSUMPTION PERIOD.
RATE CODE	U	\$	BF		AUXRATECODE	NUMERICAL READING ON METER AT BEGINNING OF PREVIOUS ENERGY CONSUMPTION PERIOD.
START OF BILLING PERIOD	U	MO/DAY/YR	BF		AUXSTDATE	THE CODE FOR A PARTICULAR RATE SCHEDULE AGAINST WHICH THE UTILITY CHARGES THE HOMEOWNER'S ENERGY CONSUMPTION.
SURCHARGE	U	\$	BF		AUXSURCHARGE	THE FIRST DAY OF THE PERIOD OVER WHICH ENERGY CONSUMPTION IS MEASURED.
TAX	U	\$	BF		AUXTAX	THE AMOUNT CHARGED BY THE UTILITY TO COVER UNEXPECTED INCREASES IN THEIR COST OF OBTAINING FUEL DURING THE PAST CONSUMPTION PERIOD.
TOTAL COST THIS PERIOD	U	\$	BF		AUXTOTCOST	THE TAX CHARGED ON THE ENERGY COST DURING THE PAST CONSUMPTION PERIOD.
	U	\$	BF			THE SUM OF THE ENERGY COST PLUS THE SUR-

I. TECHNICAL SECTION
A. AUXILIARY ENERGY

LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
U		BF	KW= KILOWATT HRS. CF= CU. FT. TH= THERMS M= MILLIONS OF CU. FT.	AUXUNITS	CHARGE PLUS THE TAX.
U		BF	SEE APPENDIX C	AUXSUPPLIER	NAME OF UTILITY COMPANY SUPPLYING THE ENERGY USED AS A BACKUP TO THE SOLAR SYSTEM.
S	10E6 BTU	FC		SUNAVAIL01 SUNAVAIL02 SUNAVAIL03 SUNAVAIL04 SUNAVAIL05 SUNAVAIL06 SUNAVAIL07 SUNAVAIL08 SUNAVAIL09 SUNAVAIL10 SUNAVAIL11 SUNAVAIL12	THE AMOUNT OF INSOLATION AVAILABLE FROM THE SUN FOR EACH MONTH OF A YEAR.
S		HA		DECDAYS DECDAYS01 DECDAYS02 DECDAYS03 DECDAYS04 DECDAYS05 DECDAYS06 DECDAYS07 DECDAYS08 DECDAYS09 DECDAYS10 DECDAYS11 DECDAYS12	A UNIT OF MEASUREMENT FOR OUTSIDE TEMPERATURE. THE NUMBER OF DAYS PER MONTH THAT DEVIATE 1 DEGREE F FROM SOME FIXED REFERENCE POINT (USUALLY 65 DEGREES F OR 18 DEGREES C) IN THE MEAN DAILY OUTDOOR TEMPERATURE.
S	MBTU	HA		SYMBTUDD	ENERGY DELIVERED PER DEGREE DAY BY EACH SOLAR SYSTEM.
L		BB		BEGINSTLDATE	ACTUAL DATE ON WHICH CONSTRUCTION OF THE

UNITS OF MEASURE

UTILITY COMPANY CODE

B. CLIMATE CONSIDERATIONS

AVAILABLE INSOLATION

DEGREE DAYS

ENERGY SUPPLIED PER DEC DAYS BY SYS

C. CONSTRUCTION INFORMATION

BEGIN SOLAR INSTALLATION DATE

LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
I. TECHNICAL SECTION C. CONSTRUCTION INFORMATION					
B		BB	SEE APPENDIX C	CPROBRK	SOLAR ENERGY SYSTEM BEGAN. GRANTEE-REPORTED PROBLEMS RELATED TO SOLAR ENERGY EQUIPMENT START-UP AND CHECK-OUT.
G		HA		BLDADDRESS BLDCITY BLDSTATE BLDSTREET BLDZIP	ADDRESS OF GRANTEE (BUILDER) CHOSEN FOR DESIGN GRANT.
G		HA		BLDCEXT BLDCNAME BLDCPHONE	NAME AND PHONE NUMBER OF CONTACT FOR THE GRANTEE (BUILDER).
G		HA		BLDHGRNO HGRNO	GRANT NUMBER ASSIGNED TO BUILDER GRANT WHICH WAS AWARDED.
G		HA		BLDNAME	NAME OF GRANTEE (BUILDER) CHOSEN FOR DESIGN GRANT.
G		HA	A= NON-PROFIT COMMUN- ITY GROUP B= BUILDER/DEVELOPER C= COOP/COND G= LOCAL GOVERNMENT I= INDIAN TRIBE N= NON-PROFIT COMMUN- ITY GROUP U= UTILITIES L= LOCAL HOUSING AUTH E= EDUCATIONAL INST S= STATE/LHA F= FEDERAL GOVERNMENT O= OTHER GROUPS	BLDORG BLDORGOTH	ORGANIZATION TO WHICH GRANTEE (BUILDER) BELONGS.
G		HA		BLDPHONE	PHONE NUMBER OF GRANTEE (BUILDER).
B		HA	SFA= SINGLE FAM ATTACH SFD= SINGLE FAM DETACH MOB= MOBILE HOME GAL= GARDEN LOWRISE	HSGTYPE	TYPE OF BUILDING OR BUILDINGS AT ONE LOCATION IN THE GRANT.

1. TECHNICAL SECTION 2. CONSTRUCTION INFORMATION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
CONSTRUCTION BEGINNING DATE	B		BB	MF= MULTI-FAM MIDRISE MFH= MULTI-FAM HIRISE OTH= OTHER	CONSTBECDATE	ACTUAL DATE ON WHICH CONSTRUCTION OF THE SOLAR BUILDINGS BEGAN.
CONSTRUCTION COMPLETION DATE	B		BB		CONSTDATE	ACTUAL DATE ON WHICH CONSTRUCTION OF BUILDING WAS COMPLETED.
DELIVERY PROBLEMS	B		BB	SEE APPENDIX C	CPROBDEL	GRANTEE-REPORTED PROBLEMS RELATED TO DELAYS IN DELIVERY OF SOLAR ENERGY EQUIPMENT.
GRANTEE REPORT 3 SUBMISSION DATE	U		BB		GR3DATE	THE DATE GRANTEE REPORT 3 WAS SUBMITTED. THIS REPORT IS DUE WHEN CONSTRUCTION IS COMPLETE.
LABOR PROBLEMS	B		BB	SEE APPENDIX C	CPROBLAB	GRANTEE-REPORTED PROBLEMS RELATED TO LABOR ON THE JOB.
NEW OR RETROFIT CONSTRUCTION	B		HA	N= NEW R= RETROFIT	NEW-RET	WHETHER THE SYSTEM WAS INCLUDED IN A NEW BUILDING OR RETROFITTED TO AN EXISTING BUILDING.
OTHER PROBLEMS	B		BB	SEE APPENDIX C	CPROBOTH	ADDITIONAL GRANTEE-REPORTED PROBLEMS CONNECTED WITH CONSTRUCTION OF SOLAR UNIT.
SOLAR INTERFACE PROBLEMS	B		BB	SEE APPENDIX C	CPROBINTF	GRANTEE-REPORTED PROBLEMS RELATED TO THE INTERFACING OF SOLAR ENERGY EQUIPMENT WITH THE BUILDING.
D. DESIGN			HA		DSCADDRESS DSCCITY DSCSTATE DSCSTREET DSCZIP	ADDRESS OF GRANTEE (DESIGNER) CHOSEN FOR DESIGN GRANT.
DESIGNER CONTACT NAME/PHONE	C		HA		DSCGEXT DSCGNAME DSCPHONE	NAME AND PHONE NUMBER OF CONTACT FOR THE GRANTEE (DESIGNER).
DESIGNER GRANT AWARD AMOUNT - ALL SYS	C		HA		DSCRAWARD	ACTUAL AMOUNT OF AWARD MADE BY HUD TO THE

I. TECHNICAL SECTION D. DESIGN	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
DESIGNER GRANT NUMBER	C		HA		DSGHRNO	GRANTEE TO DESIGN ALL SOLAR ENERGY SYSTEM(S).
DESIGNER NAME	C		HA		DSGNAME	GRANT NUMBER ASSIGNED TO BUILDER GRANT WHICH WAS AWARDED.
DESIGNER ORGANIZATION	C		HA		DSGORC	NAME OF GRANTEE (DESIGNER) CHOSEN FOR DESIGN GRANT.
DESIGNER PHONE	C		HA		DSCPPHONE	ORGANIZATION TO WHICH GRANTEE (DESIGNER) BELONGS.
FINAL - DESIGN COMPLETION DATE	L		BB		DSCDATE	PHONE NUMBER OF GRANTEE (DESIGNER).
GRANTEE REPORT 2 SUBMISSION DATE	C		BB		CR2DATE	ACTUAL DATE ON WHICH FINAL DESIGN OF THE SOLAR PROJECT WAS COMPLETED.
E. LOADS						THE DATE GRANTEE REPORT 2 WAS SUBMITTED. THIS REPORT IS DUE AFTER DESIGN REVIEW IS COMPLETE.
AUX CONTRIBUTION	S	10E6 BTU	FC		AUXCONTR08 AUXCONTR12	
COOLING LOAD	S	10E6 BTU	FC		CLOAD01 CLOAD02 CLOAD03 CLOAD04 CLOAD05 CLOAD06 CLOAD07 CLOAD08 CLOAD09 CLOAD10 CLOAD11 CLOAD12	THE RATE OF FLOW OF COOL AIR REQUIRED FOR EACH MONTH OF A YEAR TO MAINTAIN INDOOR COMFORT.
DHW LOAD	S	10E6 BTU	FC		DHWLOAD01 DHWLOAD02 DHWLOAD03 DHWLOAD04 DHWLOAD05	THE DEMAND FOR DOMESTIC HOT WATER FOR EACH MONTH OF A YEAR.

I. TECHNICAL SECTION E. LOADS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
TOTAL LOAD	S	10E6 BTU	FC		TOTLOAD01 TOTLOAD02 TOTLOAD03 TOTLOAD04 TOTLOAD05 TOTLOAD06 TOTLOAD07 TOTLOAD08 TOTLOAD09 TOTLOAD10 TOTLOAD11 TOTLOAD12	THE TOTAL ENERGY LOAD (TOTLOAD + HLOAD + DIVLOAD + CLOAD) FOR EACH MONTH OF A YEAR.
TOTAL LOAD PER YEAR	S	10E6 BTU	FC		TOTLOADYR	THE TOTAL ENERGY LOAD (TOTLOADYR = TOTLOAD + TOTLOAD + TOTDIVLOAD) FOR THE WHOLE YEAR.
F. MAINTENANCE/REPAIRS	C	NO/DAY/YR	CB		ACTDATE	THE DATE THE MAINTENANCE SERVICE WAS PERFORMED ON THE SOLAR ENERGY SYSTEM.
DATE SERVICE PERFORMED	C		CB	SEE APPENDIX C	HADELEM	HARDWARE ELEMENT THAT IS MALFUNCTIONING.
HARDWARE ELEMENT SERVICED	C		CB		FREQ	NUMBER OF TIMES THE PROBLEM HAS OCCURRED IN THE SAME GRANT.
NUMBER OF SIMILAR PROBLEMS	C		CB	MAIN= MAINTAINABILITY THER= THERMAL STRU= STRUCTURAL DURA= DURABILITY GENE= GENERAL MECH= MECHANICAL SAFE= SAFETY	PERFAREA	AREA IN WHICH THE PERFORMANCE OF THE SOLAR ENERGY SYSTEM IS ADVERSELY AFFECTED DUE TO THE IDENTIFIED PROBLEM.
PERFORMANCE AREA SERVICED	S		BB	OW= OWNER'S MANUAL ON FILE NO= OWNER'S MANUAL NOT ON FILE	SOLOWN	SPECIFIES WHETHER OR NOT A SOLAR ENERGY SYSTEM MAINTENANCE MANUAL WAS ATTACHED TO GRANTEE REPORT 3.
SOLAR OWNER'S MANUAL	C		CB	CONS= CONSTRUCTION OPER= OPERATIONAL	PHASE	PHASE OF THE PROJECT DURING WHICH THE PROBLEM OCCURED.
G. REPAIRS						
PROJECT PHASE						

1. TECHNICAL SECTION G. REPAIRS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
REASON FOR SERVICE	C		CB	DESI= DESIGN SEE APPENDIX C	EVENT1 EVENT2 EVENT3 EVENT4 EVENT5 ACTIONS	EXPLANATION OF MALFUNCTION OR PROBLEM WHICH OCCURED TO CAUSE SERVICE CALL.
REPAIR PERFORMED H. SOLAR ENERGY SYSTEM DESCRIPTION	C		CB	SEE APPENDIX C	ACTIONS	BRIEF DESCRIPTION OF REPAIR PERFORMED.
ABSORBER COATING	S		FC	FL= FLAT BLACK SE= SELECTIVE	ABSCOAT	AN INDICATION OF A FLAT BLACK OR SELECTIVE COATING ON THE ABSORBER OF THE COLLECTOR. IF DIFFERENT COLLECTORS FOR THE SYSTEM HAVE DIFFERENT ABSORBER COATINGS, THE ADDITIONAL INFORMATION WILL BE UNDER 'ABSFPMATLOTH'.
ABSORBER SUBSTRATE MATERIAL	S		FC	AL= ALUMINUM CO= COPPER ST= STEEL GS= GALVANIZED STEEL BR= BRASS PL= PLASTIC OT= OTHER	ABSSMATL	A DESCRIPTION OF THE MATERIAL USED IN THE ABSORBER SUBSTRATE. IF DIFFERENT COLLECTORS FOR THE SYSTEM HAVE DIFFERENT SUBSTRATE MATERIALS, THE ADDITIONAL INFORMATION WILL BE UNDER 'ABSFPMATLOTH'.
ABSORBER - OTHER	S		FC		ABSFPMATLOTH	INFORMATION, USUALLY CONCERNING MULTIPLE COLLECTORS WITH DIFFERENT CHARACTERISTICS, WHICH COULD NOT BE RECORDED ELSEWHERE.
AIR FLOW CORR FACTOR	S		FC		TMAIRCORR	AIR FLOW CORRECTION FACTOR TO ACCOUNT FOR THE EFFECT OF STRATIFICATION IN THE STORAGE MEDIUM. IT EQUALS THE FLOW RATE OF AIR THROUGH THE COLLECTORS / COLLECTOR AREA * SPECIFIC HEAT OF AIR.
AUXIL. TANK STORAGE VOLUME (DHW)	S		FC		STORAVOLDHW STORAVOLDHWU	THE VOLUME OF THE AUXILIARY (BACK UP) STORAGE TANK IN THE SOLAR DOMESTIC HOT WATER SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
AUXIL TANK STORAGE VOLUME (HEAT)	S		FC		STORAVOLH	THE VOLUME OF THE AUXILIARY (BACK UP)

I. TECHNICAL SECTION II. SOLAR ENERGY SYSTEM DESCRIPTION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
AZIMUTH ANGLE	S	DEGREES	FC		STORAVOLHU	STORAGE TANK IN THE SOLAR HEATING SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
BACK INSULATION	S		FC	GF= GLASS FOAM NW= MINERAL WOOD CS= CALCIUM SILICATE IS= ISOCYANURATE GL= GLASS FIRER PO= POLYURETHANE ST= STYROFOAM OT= OTHER	AZANGLE INSLAYER1 INSLAYER2 INSLAYER3	THE NUMBER OF DEGREES FROM THE SOUTH THAT THE COLLECTOR IS ORIENTED (IE 0 DEG = SO, 90 DEGS = WEST, ETC). IF THE COLLECTOR IS ADJUSTABLE OR IF THE SYSTEM HAS AN ARRAY OF COLLECTORS, AN APPROPRIATE MEAN VALUE IS USED. THE KIND OF MATERIAL USED TO INSULATE THE BACK OF THE ABSORBER. THE FIRST LAYER IS CLOSEST TO THE ABSORBER. THERE MAY BE FROM ONE TO THREE LAYERS DESCRIBED.
BACK INSULATION R-VALUE	S		FC		INSRVALUE	THE TOTAL R-VALUE (RESISTANCE) FOR ALL LAYERS OF BACK INSULATION FOR THE ABSORBER.
COLLECTOR APERTURE AREA	S	SQ FT	IIA		COLSQFT	GROSS APERTURE AREA OF THE COLLECTOR ARRAY USED IN ONE SOLAR SYSTEM AT ONE LOCATION. EACH SYSTEM AT THAT LOCATION IS THE SAME SIZE.
COLLECTOR TYPE	S		IIA	EVT= EVACUATED TUBE FLP= FLAT PLATE CNC= CONCENTRATING OTH= OTHER OR ANY COMBINATION OF D, N, AND/OR I WHERE D= DIRECT N= INDIRECT I= ISOLATED	COLTYPE	THE TYPE OF COLLECTOR. FOR PASSIVE SYSTEMS, THIS THREE CHARACTER ALPHABETIC FIELD CAN DENOTE DIRECT, INDIRECT AND/OR ISOLATED HEAT GAIN.
COMB HEAT EXCHANGE EFF COL-STOR	S	PERCENT	FC		HEXEFFCOOL	THE COMBINED HEAT EXCHANGER EFFECTIVENESS IN THE COLLECTOR-TO-STORAGE LOOP OF THE

I. TECHNICAL SECTION H. SOLAR ENERGY SYSTEM DESCRIPTION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
COMB HEAT EXCHANGE EFF ↓ STOR - LOAD	S	PERCENT	FC		HEXEFFSTOR	SOLAR SYSTEM. THE COMBINED HEAT EXCHANGER EFFECTIVENESS IN THE STORAGE-TO-LOAD LOOP OF THE SOLAR SYSTEM.
CONDITIONED AREA PER BLDG	B	SQ FT	HA		SYSHEATAREA	THE AREA TO BE HEATED/COOLED BY A SYSTEM.
COVER PLATE MATERIAL	S		FC	GL= GLASS GW= GLASS, WATER WHITE CN= GLASS, NORMAL IRON FR= FIBERGLASS REIN- FORCED PLACE PS= POLYCARBONATE SHEET AS= ACRYLIC SHEET TF= TEFLON FILM TD= TEDLAR FILM MY= MYLAR OT= OTHER	GPMATLOTH1 GPMATLOTH2 GPMATL1 GPMATL2	A CODED VALUE AND OTHER INFORMATION ABOUT THE KIND OF MATERIAL USED IN THE OUTER AND INNER (IF ANY) COVER PLATE ON THE COLLECTOR.
COVER PLATE MATERIAL DESCRIPTION	S		FC	UV= UVTREATED SS= SINGLE-STRENGTH DS= DOUBLE-STRENGTH TE= TEMPERED RE= REINFORCED SH= SHEET OT= OTHER PO= POLYESTER RESIN EP= EPOXY RESIN	CPMATDESC1 CPMATDESC2	A DESCRIPTION OF THE CHARACTERISTICS OF THE MATERIAL USED IN THE OUTER AND INNER (IF ANY) COVER PLATE ON THE COLLECTOR.
COVER PLATE THICKNESS	S		FC		CPTHICK1 CPTHICK2	AVERAGE THICKNESS OF THE OUTER AND INNER (IF ANY) COVER PLATE ON THE COLLECTOR.
C-D	S		FC		CD	FACTOR USED IN HEAT LOSS CALCULATIONS TO DETERMINE THE HEAT LOAD OF A BUILDING.
DENSITY	S		FC		TMDENSITY	THE DENSITY OF THE TRANSFER MEDIUM IN THE COLLECTOR LOOP.
DHW CAPACITY	S	GALLONS	FC		DHWCAP	THE CAPACITY OF THE AUXILIARY (BACK UP) DOMESTIC HOT SYSTEM TO SUPPLY HOT WATER.

I. TECHNICAL SECTION H. SOLAR ENERGY SYSTEM DESCRIPTION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
DHW INLET TEMP	S	DEGREES	FC		DHWINLET01 DHWINLET02 DHWINLET03 DHWINLET04 DHWINLET05 DHWINLET06 DHWINLET07 DHWINLET08 DHWINLET09 DHWINLET10 DHWINLET11 DHWINLET12	MONTHLY INLET TEMPERATURE FOR THE DOMESTIC WATER SOURCE.
DHW SET TEMP	S		FC		DHWSETTEMP	THE SET TEMPERATURE (TEMPERATURE AT WHICH THE AUXILIARY FUEL IS USED) OF THE DOMESTIC HOT WATER SYSTEM.
DHW USAGE	S		FC		DHWUSAGE	THE PREDICTED DOMESTIC HOT WATER USAGE DEMAND FOR THIS SYSTEM.
FLOW RATE	S		FC		TMFLOW TMFLOWU	THE FLOW RATE OF THE TRANSFER MEDIUM. IF AIR, THE RATE IS RECORDED IN CU.FT. PER MINUTE; IF LIQUID, IN GALLONS PER MINUTE.
FLUID PASSAGE MATERIAL	S		FC	AL= ALUMINUM CO= COPPER ST= STEEL GS= GALVANIZED STEEL BR= BRASS PL= PLASTIC OT= OTHER	ABSFPMATL	A DESCRIPTION OF THE MATERIAL USED IN THE FLUID PASSAGE PART OF THE ABSORBER (FOR A LIQUID SYSTEM). IF DIFFERENT COLLECTORS FOR THE SYSTEM HAVE DIFFERENT FLUID PASSAGE MATERIALS, THE ADDITIONAL INFORMATION WILL BE UNDER 'ABSFPMATLOTH'.
FREEZE PROTECTION	S		FC	AI= AIR AN= ANTI-FREEZE FR= FREEZE TOLERANT DD= DRAIN DOWN DB= DRAIN BACK OT= OTHER HE= HEAT TAPE	COLFRPROT	THE METHOD USED TO PROTECT THE LIQUID SYSTEM FROM FREEZING DURING THE WINTER MONTHS.
FR-PRIME-TAU	S		FC		FRPRIMETAU	THE PRIME OF 'PANELINT' WHICH TAKES INTO ACCOUNT THE HEAT EXCHANGER(S) IN THE LOOP.

I. TECHNICAL SECTION H. SOLAR ENERGY SYSTEM DESCRIPTION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
FR-PRIME-UL	S		FC		FRPRIMEUL	THE PRIME OF 'PANELSLOPE' WHICH TAKES INTO ACCOUNT THE HEAT EXCHANGER(S) IN THE LOOP.
HEAT PUMP NOMINAL CAPACITY	S	BTU/HR	FC		HPUMPCAP	THE NOMINAL CAPACITY OF THE HEAT PUMP TO TRANSFER HEAT FROM ONE MEDIUM TO ANOTHER.
HEAT PUMP TYPE	S		FC	SE= SERIES PA= PARALLEL HY= HYBRID	HPUMPTYPE	THE TYPE OF HEAT PUMP USED IN THE SOLAR SYSTEM.
INCIDENCE ANGLE MODIFIER	S		FC		INCANGMOD	THE ANGLE OF INCIDENCE IS THE ANGLE BETWEEN A RAY OF SUNLIGHT AND A LINE DRAWN PERPENDICULAR TO THE ABSORBER PLATE. SINCE THE TILT ANGLE AND LATITUDE OF THE SOLAR PANEL CAN EASILY BE DETERMINED, TABLES EXIST THAT GIVE A 'MODIFIER' WHICH CAN BE USED TO CALCULATE THE INCIDENCE ANGLE FOR THE COLLECTOR.
MAIN TANK STORAGE MEDIUM (DHW)	S		FC	SEE STORMMEDH	STORMMEDHW	THE MATERIAL (STONE, WATER, EARTH, ETC.) USED TO STORE THE EXCESS SOLAR HEAT COLLECTED. THIS HEAT IS THEN EXTRACTED AND USED TO HELP HEAT THE DOMESTIC HOT WATER.
MAIN TANK STORAGE MEDIUM (HEAT)	S		FC	ST= STONE CO= CONCRETE BR= BRICK WA= WATER EA= EARTH PH= PHASE-CHANGE MATERIAL OT= OTHER	STORMMEDH	THE MATERIAL (STONE, WATER, EARTH, ETC.) USED TO STORE THE EXCESS SOLAR HEAT COLLECTED. THIS HEAT IS THEN EXTRACTED AND USED TO HELP HEAT THE BUILDING.
MAIN TANK STORAGE VOLUME (DHW)	S		FC		STORMVOLDHW STORMVOLDHWL	THE VOLUME OF THE MAIN STORAGE TANK IN THE SOLAR DOMESTIC HOT WATER SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM, (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
MAIN TANK STORAGE VOLUME (HEAT)	S		FC		STORMVOLH STORMVOLHU	THE VOLUME OF THE MAIN STORAGE TANK IN THE SOLAR HEATING SYSTEM. FOR LIQUID STORAGE

LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
I. TECHNICAL SECTION II. SOLAR ENERGY SYSTEM DESCRIPTION					
NET AREA	SQ FT	FC		COLNAREA	MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
NUMBER OF COVER PLATES	S	FC		CPN01 CPN02	THE SURFACE AREA OF THE COLLECTOR, EXCLUDING THE FRAME.
PANEL INTERCEPT	S	FC		PANELINT	THE NUMBER OF COVER PLATES THE AVERAGE COLLECTOR IN THIS SYSTEM HAS.
PANEL SLOPE	S	FC		PANELSLOPE	THE Y-INTERCEPT OF THE EFFICIENCY CURVE MEASURED FOR THE COLLECTOR PANEL.
PRE-HEAT TANK STORAGE VOLUME (DHW)	S	FC		STORPVOLDHW STORPVOLDHWU	THE SLOPE OF THE EFFICIENCY CURVE MEASURED FOR THE COLLECTOR PANEL.
PRE-HEAT TANK STORAGE VOLUME (HEAT)	S	FC		STORPVOLH STORPVOLHU	THE VOLUME OF THE PRE-HEAT STORAGE TANK IN THE SOLAR DOMESTIC HOT WATER SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
SOLAR ENERGY SUPPLIED PER YR BY SYS	S MBTU	HIA		SYSMBTU	THE VOLUME OF THE PRE-HEAT STORAGE TANK IN THE SOLAR HEATING SYSTEM. FOR LIQUID STORAGE MEDIUM, THE VOLUME IS IN GALLONS; FOR SOLID STORAGE MEDIUM (IE, STONE, CONCRETE, ETC.), THE VOLUME IS IN CU.FT.
SOURCE CODE 1	S	FC	C= CALCULATED D= DRAWING E= ESTIMATE F= DEFAULT G= GRANT APPLICATION I= INDEPENDENT TEST LAB N= MEASURED O= OTHER TEST LABS P= PHOTO T= MANUFACTURE'S TEST	SOURCE1	PREDICTED ANNUAL SOLAR ENERGY DELIVERED BY EACH SYSTEM TO LOAD.
SOURCE CODE 10	S	FC		SOURCE10	SOURCE OF AZIMUTH ANGLE.
SOURCE CODE 10	S	FC		SOURCE10	SOURCE OF DHW CAPACITY.

I. TECHNICAL SECTION II. SOLAR ENERGY SYSTEM DESCRIPTION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
SOURCE CODE 11	S		FC		SOURCE11	SOURCE OF DHW USAGE.
SOURCE CODE 12	S		FC		SOURCE12	SOURCE OF DHW SET TEMPERATURE.
SOURCE CODE 13	S		FC		SOURCE13	SOURCE OF FR-PRIME-TAU.
SOURCE CODE 14	S		FC		SOURCE14	SOURCE OF FR-PRIME-UL.
SOURCE CODE 15	S		FC		SOURCE15	SOURCE OF VENTILATION.
SOURCE CODE 16	S		FC		SOURCE16	SOURCE OF INTERNAL HEAT LOAD.
SOURCE CODE 2	S		FC		SOURCE2	SOURCE OF TILT ANGLE.
SOURCE CODE 3	S		FC		SOURCE3	SOURCE OF PANEL INTERCEPT.
SOURCE CODE 4	S		FC		SOURCE4	SOURCE OF PANEL SLOPE.
SOURCE CODE 5	S		FC		SOURCE5	SOURCE OF COMB HEAT EXCHANGE EFF COL-STOR.
SOURCE CODE 6	S		FC		SOURCE6	SOURCE OF COMB HEAT EXCHANGE EFF STOR-LOAD.
SOURCE CODE 7	S		FC		SOURCE7	SOURCE OF TOTAL HEAT LOSS FACTOR.
SOURCE CODE 8	S		FC		SOURCE8	SOURCE OF C-D.
SOURCE CODE 9	S		FC		SOURCE9	SOURCE OF AUXIL TANK STORAGE VOLUME (DHW).
SPECIFIC HEAT	S		FC		TMSPECHEAT	THE SPECIFIC HEAT OF THE TRANSFER MEDIUM IN THE COLLECTOR LOOP.
STORAGE CAPACITY	S	BTU-SQFT	FC		STORCAP	THE QUANTITY OF HEAT THAT CAN BE STORED IN THE MAIN STORAGE TANKS OF THE SOLAR SYSTEM. (STORCAP = (STORMVOLH + STORMVOLDHW - STORPVOLDHW) * STORAGE DENSITY * STORAGE SPECIFIC HEAT / GROSS COLLECTOR AREA).
STORAGE TEMP IN MAIN TANK - LOWER	S	DEGREES	FC		STORTEMPL	THE LOWER LIMIT (MINIMUM) TEMPERATURE

I. TECHNICAL SECTION H. SOLAR ENERGY SYSTEM DESCRIPTION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
STORAGE TEMP IN MAIN TANK - UPPER	S	DEGREES	FC		STORTEMU	SETTING OF THE MAIN STORAGE TANK OF THE SOLAR DOMESTIC HOT WATER SYSTEM.
SYSTEM FUNCTION	S		IIA	ANY COMB OF H, C AND W WHERE H= HEATING C= COOLING W= DHW	SYSTYPE	THE UPPER LIMIT (MAXIMUM) TEMPERATURE SETTING OF THE MAIN STORAGE TANK OF THE SOLAR DOMESTIC HOT WATER SYSTEM.
SYSTEM KIND	S		IIA	A= ACTIVE P= PASSIVE	SYSKIND	THE APPLICATION(S) OF THE SOLAR ENERGY SYSTEM. FOR EXAMPLE, HEATING, COOLING, HOT WATER.
SYSTEM MANUFACTURER (ALPHA CODE)	S		IIA	SEE APPENDIX C	SYSMFCR-A	WHETHER THE SYSTEM IS ACTIVE, PASSIVE, OR HYBRID. CODED-4 CHARACTER ALPHABETIC CODE REPRESENTING THE MANUFACTURER OF THE SOLAR SYSTEM.
SYSTEM NUMBER (PER MODEL)	S		IIA		SYSNO	THE SEQUENCE (1 OR 2) ASSIGNED TO VARIOUS SYSTEMS (WITHIN ONE LOCATION, THE SAME MODEL) OF A GRANT. THERE ARE NEVER MORE THAN 2 SYSTEM IN SEQUENCE FOR THE SAME MODEL - AN ACTIVE AND A PASSIVE ONE.
SYSTEM TRANSFER MEDIUM	S		IIA	A= AIR L= LIQUID R= RADIANT	SYSTRMED	DESCRIPTION OF TYPE OF TRANSFER MEDIUM USED IN THE ACTIVE COLLECTOR: AIR OR LIQUID. IF SOLAR SYSTEM IS PASSIVE, CAN DENOTE RADIANT TRANSFER MEDIUM.
SYSTEM TYPE	S		FC	1= AIR 2= LIQUID 3= DHW ONLY	FCSYSTYPE	THE TYPE OF SOLAR SYSTEM (USED IN FCHART CALCULATIONS).
THERMAL CAPACITANCE	S	BTU X 10E3	FC		STORTHERM	(THERMAL CAPACITANCE) THAT PROPERTY OF THE COLLECTOR WHICH DETERMINES HOW MUCH HEAT IS NEEDED TO WARM IT TO ITS OPERATING TEMPERATURE.
TILT ANGLE	S	DEGREES	FC		COLTILT	THE ANGLE FROM THE HORIZONTAL AT WHICH THE COLLECTOR IS TILTED. IF THE COLLECTOR IS ADJUSTABLE OR IF THE SYSTEM HAS AN ARRAY OF COLLECTORS, THE AVERAGE TILT

I. TECHNICAL SECTION H. SOLAR ENERGY SYSTEM DESCRIPTION	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
TOTAL HEAT LOSS FACTOR	S	BTU/HR	FC		TOTALUA	ANGLE IS USED.
TRANSPORT MEDIUM	S		FC	AI= AIR WA= WATER EG= ETHYLENE GLYCOL PC= PROPYLENE GLYCOL SI= SILICONE AP= ALKYLATED PHENOL OI= OILS CL= GLCERINE OT= OTHER	TMED TMEDOTH	THE RATE OF HEAT TRANSMISSION FOR THE BUILDING USING THE SYSTEM. THE SUBSTANCE (AIR, WATER, ETC.) WHICH CARRIES HEAT FROM THE SOLAR COLLECTOR TO STORAGE.
VENTILATION	S	AIRCHNGS/HR	FC		VENT	NUMBER OF AIR CHANGES PER HOUR WHICH REPRESENT THE VENTILATION OF THE SYSTEM.
WATER PERCENT BY VOLUME	S	PERCENT	FC		TMPCENT	THE PERCENT OF WATER (BY VOLUME) IN THE TRANSFER MEDIUM IN THE COLLECTOR LOOP.
I. SOLAR ENERGY SYSTEM PERFORMANCE AUX CONTRIBUTION	S	10E6 BTU	FC		AUXCONTR01 AUXCONTR02 AUXCONTR03 AUXCONTR04 AUXCONTR05 AUXCONTR06 AUXCONTR07 AUXCONTR09 AUXCONTR10 AUXCONTR11	THE ENERGY CONTRIBUTION EXPECTED FROM THE AUXILIARY SYSTEM FOR EACH MONTH OF A YEAR.
PROJECT INSTR	C		BA	I= INSTR. N= NOT INSTR.	PJINSTR	SPECIFIES WHETHER ANY SYSTEM OF THIS GRANT WILL BE INSTRUMENTED OR NOT.
SOLAR CONTRIBUTION	S	10E6 BTU	FC		SOLARCONTR01 SOLARCONTR02 SOLARCONTR03 SOLARCONTR04 SOLARCONTR05 SOLARCONTR06 SOLARCONTR07	THE ENERGY CONTRIBUTION EXPECTED FROM SOLAR FOR EACH MONTH OF A YEAR.

LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
I.					
I.					
	U	BC	I= INSTRUMENTED N= NOT INSTRUMENTED	SOLARCONTR08 SOLARCONTR09 SOLARCONTR10 SOLARCONTR11 SOLARCONTR12	SPECIFIES WHETHER THIS UNIT WILL BE INSTRUMENTED OR NOT.
	S	BB		UNITINSTR	ACTUAL DATE ON WHICH THE SOLAR ENERGY SYSTEM TEST WAS COMPLETED.
	S	FC		TESTCOMPDATE SOLFRACT01 SOLFRACT02 SOLFRACT03 SOLFRACT04 SOLFRACT05 SOLFRACT06 SOLFRACT07 SOLFRACT08 SOLFRACT09 SOLFRACT10 SOLFRACT11 SOLFRACT12	THE PERCENTAGE OF THE BUILDING'S MONTHLY HEATING REQUIREMENT PROVIDED BY THE SOLAR SYSTEM.
	S	FC		TOTAUXCONTR	THE ENERGY CONTRIBUTION EXPECTED FROM THE AUXILIARY SYSTEM FOR THE WHOLE YEAR.
	S	FC		TOTSOLCONTR	THE ENERGY CONTRIBUTION EXPECTED FROM SOLAR FOR THE WHOLE YEAR.
	S	FC		TOTSOLFRACT	THE PERCENTAGE OF THE BUILDING'S YEARLY HEATING REQUIREMENT PROVIDED BY THE SOLAR SYSTEM.
J.		BB	WA= WARRANTY ON FILE NO= NOT ON FILE	SOLWARR	INDICATES WHETHER OR NOT A SOLAR WARRANTY WAS ATTACHED TO GRANTEE REPORT 3.

	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
11. MARKETING A. BACKGROUND EXPERIENCE						
OCCUPANCY DATE	U		BC		OCCDATE	GRANTEE'S REPORT ON ACTUAL DATE ON WHICH SOLAR UNIT WAS FIRST OCCUPIED.
SALES CONTRACT DATE	U		BC		CONTRDATE	GRANTEE'S REPORT ON ACTUAL DATE ON WHICH THE SOLAR ENERGY UNIT'S SALES CONTRACT WAS SIGNED.
UNIT FIRST OFFERED DATE	U		BC		OFFERDATE	GRANTEE'S REPORT ON ACTUAL DATE ON WHICH THE SOLAR ENERGY UNIT WENT UP FOR SALE OR RENT.
B. PRICES						
FINAL BUYING PRICE	U		BC		ENDSALEPRICE	FINAL SALE PRICE FOR THE SOLAR UNIT.
FINAL RENT	U		BC		ENDRENT0TH ENDRENT1ST ENDRENT2 ENDRENT3	FINAL RENTAL RATE FOR THE SOLAR UNIT.
INITIAL BUYING PRICE	U		BC		INITSALEPRICE	INITIAL SALE PRICE FOR THE SOLAR UNIT.
INITIAL RENT	U		BC		INITRENT0TH INITRENT1ST INITRENT2 INITRENT3	INITIAL RENTAL RATE FOR THE SOLAR UNIT.
C. PROBLEMS						
MARKETING PROBLEMS	U		BC	SEE APPENDIX C	MKTPROB	BUILDER'S DESCRIPTION OF PROBLEMS WITH THE SOLAR SYSTEM DURING MARKETING PERIOD AND INITIAL OCCUPANCY.
D. MARKET METHODS/EFFECTIVENESS						
NO OF VISITORS	U		BC		MKTVNO	TOTAL NUMBER OF VISITORS TO THIS SOLAR UNIT DURING THE MARKETING PERIOD.
PUBLIC INTEREST IN BUYING SOLAR	U		BC	SEE APPENDIX C	MKTUBLIC	BUILDER'S PERCEPTIONS OF PUBLIC INTEREST IN SOLAR.
E. PROSPECTIVE BUYERS/RENTERS						
HUD ACCESS TERMS FOR UNIT	U		BD	HU= HUD ACCESS TERMS ON FILE	HTERMS	THE TERMS OF THE AGREEMENT WHICH HUD HAS WITH THE GRANTEE FOR ACCESS TO THE

LEVEL	UNITS	FTE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
II. MARKETING E. PROSPECTIVE BUYERS/RENTERS					
NO OF BUYERS	U	BC	NO= HUD ACCESS TERMS NOT ON FILE	MKTENO	FUNDED UNITS. THE ACCESS IS PROVIDED PRIMARILY TO GATHER DATA OVER A 5 YEAR PERIOD.
F. SOLAR PROJECT CHARACTERISTICS					
APPLICATION NUMBER	C	HA		APNO	TOTAL NUMBER OF PROSPECTIVE BUYERS TO THIS SOLAR UNIT DURING THE MARKETING PERIOD.
CYCLE	C	IIA	CYCLES ARE 1-5, 4A, P1 (PASSIVE)	CYCLE CYC-MRC	A FOUR DIGIT NUMBER (0001-9999) ASSIGNED TO AN APPLICATION FOR GRANT. WHEN GRANTS ARE AWARDED, A GRANT NUMBER IS ASSIGNED. DENOTES WHEN THE GRANT WAS AWARDED: CYCLE 1 8 6 -FALL 75 2 -FALL 76 3 -SUMMER 77 4 -1978 4A -1978 P1 -JUNE 1979 5 -FALL 1979
DISPOSITION OF UNITS	B	IIA	ANY COMB OF P, O, AND TO DESCRIBE THE DIS POSITION OF THE PROJEC WHERE P= PRIVATE O= OPEN MARKET C= CONCEPT	DISP	DESCRIBES HOW THE UNITS WILL BE DISPOSED OF (IF AT ALL).
LOCATION NUMBER	L	IIA		PJLOCNO	THE SEQUENCE (1,2,3,ETC) ASSIGNED TO VARIOUS LOCATIONS FOR BUILDINGS OF A GRANT.
MODEL NUMBER (PER LOCATION)	B	IIA		MODSEQ	THE SEQUENCE (1,2,3,ETC) ASSIGNED TO VARIOUS MODEL TYPES (WITHIN ONE LOCATION) OF A GRANT.
NEW OR RETROFIT CONSTRUCTION	C	IIA	N= NEW R= RETROFIT	NEWRET	SPECIFIES WHETHER THE CONSTRUCTION FOR THIS GRANT WILL BE NEW OR RETROFIT.
NUMBER OF BUILDINGS	B	IIA		PJBLDGS	THE NUMBER OF BUILDINGS FOR ONE MODEL TYPE (NOTE: THE CONDITIONED AREA AND COLLECTOR AREA IS THE SAME FOR EACH BUILDING.)
NUMBER OF SOLAR SYSTEMS	B	IIA		PJSYS	TOTAL NUMBER OF SOLAR ENERGY SYSTEMS FOR

II. MARKETING F. SOLAR PROJECT CHARACTERISTICS	LEVEL	UNITS	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
NUMBER OF UNITS	B	HA		PJUNITS	ONE MODEL TYPE. DEFINES THE NUMBER OF DWELLING UNITS THAT ARE PRESENT IN BUILDING(S) FOR ONE MODEL TYPE.
PROJECT ADDRESS	L	HA		PJCITY PJCITY-RPT1 PJCNTY PJCNTY-RPT1 PJSTATE PJSTATE-RPT1 PJSTREET PJZIP PJZIP-RPT1	THE ADDRESSES OF THE BUILDING PROJECT FOR WHICH A GRANT WAS AWARDED.
PROJECT TYPE	B	HA		PJCAT	THE TYPE OF BUILDING PROJECT: DESIGN, CONSTRUCT OR RETROFIT.
SALES/RENTAL TERMS FOR UNIT	U	BB	SA= SALES/RENT ACREE MENT ON FILE NO= SALES/RENT ACREE MENT NOT ON FILE	SRTERMS	THE TERMS OF THE AGREEMENT BETWEEN THE GRANTEE AND THE BUYER/RENTER OF THE HUD FUNDED DWELLING UNIT. THESE TERMS INCLUDE THE HUD ACCESS AGREEMENT AND ARE PART OF THE SALES CONTRACT, DEED, OR LEASE AGREEMENT.
SEA (STANDARD ECONOMIC AREA)	B	HA		PJSEA	DEMOGRAPHIC CLASSIFICATION.
UNIT STATUS	U	BC	SO= SOLD RE= RENTED NO= MODEL	UNITSTATUS	THE STATUS OF A UNIT FUNDED UNDER THIS GRANT. UNITS FOR THE SAME GRANT MAY HAVE A DIFFERENT STATUS -- USUALLY WITH ONE UNIT BEING A MODEL.
G. SOLAR ENERGY SYSTEM COSTS	C	HA		SYSCOSTEST	GRANTEE'S ESTIMATE OF THE COST OF ALL THE SOLAR ENERGY SYSTEMS COVERED BY THE GRANT.
BUILDER ESTIMATED \$ OF ALL SYSTEMS	C	HA		BLDCRAWARD CRAWARD	ACTUAL AMOUNT OF AWARD MADE BY HUD TO THE GRANTEE TO BUILD ALL SOLAR ENERGY SYSTEM(S).
BUILDER GRANT AWARD AMOUNT - ALL SYS	C	HA		SYSCOSTCVT	THE COST TO HUD (AMOUNT FUNDED) FOR ONE SOLAR ENERGY SYSTEM; ALL SYSTEMS AT ONE

LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
11. MARKETING C. SOLAR ENERGY SYSTEM COSTS					
INDIVIDUAL SYSTEM COST	S \$	HA		INDSYSCOST	LOCATION FOR THE SAME MODEL HAVE THE SAME FUNDING. THE COST TO THE BUILDER FOR ONE SOLAR ENERGY SYSTEM; ALL SYSTEMS AT ONE LOCATION FOR THE SAME MODEL COST THE SAME.
* REQUESTED BY BUILDER FOR ALL SYS	C \$	HA		CRREQUEST	THE FUNDS REQUESTED TO COVER THE GRANTEE'S BUILDING COSTS OF ADDING SOLAR ENERGY SYSTEM(S) TO BASIC HOME(S).
* REQUESTED BY DESIGNER FOR ALL SYS	C \$	HA		DSCRCOST	THE FUNDS REQUESTED TO COVER THE GRANTEE'S DESIGN COSTS TO ADD SOLAR ENERGY SYSTEM(S) TO BASIC HOME(S).

III. FINANCIAL
A. CONSTRUCTION FINANCING

BUILDER FINANCING

LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
C		HA	A03= MKT RATE/SALES A06= MKT RATE/RENT A09= MKT RATE/COOP /CONDO A12= MKT RATE/COOP /CONDO A15= MKT RATE/COOP /CONDO B03= MKT RATE/FHA SECT 207 B06= MKT RATE/FHA SECT 213 B09= MKT RATE/FHA SECT 221(D)(4) B12= MKT RATE/FHA SECT 223(F) B15= MKT RATE/FHA SECT 234 C03= FHA S. 202 C06= FHA S. 202/S. 8 C09= FHA S. 221(D)(3) C12= FHA S. 221(D)(3) /SECT 8 C15= FHA S. 221(D)(3) ST/LOC/S. 8 C18= FHA S. 221(D)(4) /SECT 8 C21= FHA S. 231/ST/ LOC/S. 8 C24= FHA S. 236 C27= FHA S. 236/S. 8 C30= HUD PUB HOUSING C33= HUD IND MUTUAL HELP PROGRAM C36= HUD SECT 312 C39= HUD/CDBG C42= FMIA SECT 502 C45= FMIA S. 514/516 /SECT 8 C48= FMIA SECT 515 C51= FMIA S. 515/S. 8 C54= STATE/LOCAL C57= STATE/LOCAL/S. 8	BLDFIN	THE METHOD BY WHICH THE BUILDER PLANS TO FINANCE THE BUILDING PROJECT.

LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
111. FINANCIAL A. CONSTRUCTION FINANCING					
CONSTRUCTION FINANCING AMNT	L	BB	C60= ST (PUB HOUSING) C63= MARKET RATE/S. B D03= EDUCATION	CFINAMNT	THE AMOUNT OF MONEY IN DOLLARS PROVIDED FOR CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING DATE	L	BB		CFINDATE	ACTUAL DATE ON WHICH CONSTRUCTION FINANCING WAS COMMITTED TO THE SOLAR PROJECT.
CONSTRUCTION FINANCING ORG	L	BB		CFINORG	GRANTEE'S REPORT OF ACTUAL ORGANIZATION THAT GAVE THE CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING ORG ADDRESS	L	BB		CFINCITY CFINSTATE CFINSTREET CFINZIP	GRANTEE'S REPORT OF FULL ADDRESS OF ACTUAL ORGANIZATION THAT GAVE THE CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING PERIOD	L	BB		CFINPERIOD	TIME IN NUMBER OF MONTHS FOR WHICH THE CONSTRUCTION LOAN WAS GIVEN.
CONSTRUCTION FINANCING PHONE	L	BB		CFINPHONE	GRANTEE'S REPORT OF TELEPHONE NUMBER OF ACTUAL ORGANIZATION THAT GAVE THE CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING PROB	L	BA	SEE APPENDIX C	CFINPROB	DESCRIBES EXPERIENCE/PROBLEMS OF BUILDER IN OBTAINING CONSTRUCTION FINANCING.
CONSTRUCTION FINANCING RATE	L	BB		CFINRATE	RATE OF INTEREST ON CONSTRUCTION LOAN.
CONSTRUCTION FINANCING STATUS	L	BA	YE= YES NO= NO PE= PENDING	CFINSTAT	THE STATUS OF CONSTRUCTION FINANCING FOR THIS BUILDING PROJECT.
CONSTRUCTION FINANCING TYPE	L	BB	NO= NORMAL SE= SELF PR= PRIVATE PU= PUBLIC LOAN (GRANT) OT= OTHER	CFINTYPE	SPECIFIES FROM WHERE THE CONSTRUCTION FINANCING IS COMING.
B. PERMANENT FINANCING/MORTGAGE MARKETING PERIOD	U	BC		MKTPERIOD	MARKETING PERIOD OF UNIT IN WEEKS.

III. FINANCIAL B. PERMANENT FINANCING/MORTGAGE	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
MORTGAGE AMNT	U		BC		MTCAMNT	DOLLAR AMOUNT OF FULL PERMANENT MORTGAGE.
MORTGAGE APPROVAL DATE	U		BC		MTCAPPDATE	CLOSING DATE OR APPROVAL DATE OF THE MORTGAGE.
MORTGAGE ARRANGED BY	U		BC	BU= BUYER PU= PURCHASER GR= GRANTEE	MTCARRANGE	SPECIFIES WHETHER THE PERMANENT FINANCING WAS ARRANGED BY THE BUILDER, PURCHASER, OR GRANTEE.
MORTGAGE FEES	U		BC		MTCFEES	FEES ON THE PERMANENT MORTGAGE.
MORTGAGE PERIOD	U		BC		MTCPERIOD	PERIOD IN YEARS OF THE PERMANENT MORTGAGE.
MORTGAGE PROBLEMS	U		BC	SEE APPENDIX C	MTCPROB	GRANTEE'S REPORT ON ANY PROBLEMS IN OBTAINING PERMANENT FINANCING.
MORTGAGE RATE	U		BC		MTCRATE	INTEREST RATE RECEIVED ON THE PERMANENT MORTGAGE.
MORTGAGE TYPE	U		BC	NO= NONE CO= CONVENTIONAL FH= FHA VA= VA PR= PRIVATE OT= OTHER	MTCATYPE	SPECIFIES TYPE OF MORTGAGE.
MORTGACOR	U		BC		MORTGACOR	NAME OF THE FIRM OR ORGANIZATION GRANTING THE PERMANENT MORTGAGE.
MORTGACOR ADDRESS	U		BC		MTCACITY MTCSTATE MTCSTREET MTCZIP	FULL ADDRESS OF THE ORGANIZATION GRANTING THE PERMANENT MORTGAGE.
MORTGACOR PHONE	U		BC		MTCPHONE	TELEPHONE NUMBER OF THE FIRM GRANTING THE PERMANENT MORTGAGE.

IV. INSTITUTIONAL/LEGAL A. BUILDING CODES	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
BUILDING PERMIT APPROVAL DATE	B		BB		BPERDATE	DATE ON WHICH BUILDING PERMIT, IF REQUIRED WAS APPROVED.
BUILDING PERMIT AUTHORITY	B		BB		BPERAUTH	NAME OF BUILDING PERMIT AUTHORITY.
BUILDING PERMIT AUTHORITY ADDRESS	B		BB		BPERCITY BPERSTATE BPERSTREET BPERZIP	ADDRESS OF BUILDING PERMIT AUTHORITY.
BUILDING PERMIT PROBLEMS	B		BB	SEE APPENDIX C	BPERPROB	GRANTEE'S REPORT ON ANY PROBLEM RELATED TO OBTAINING A BUILDING PERMIT.
CODE BASED OR NOT	B		BB	BA= BASED ON NATIONAL CODES NO= NOT BASED ON NATIONAL CODES	CODEBASED	GRANTEE'S REPORT OF WHETHER CODE IS BASED ON NATIONAL MODEL CODE.
CODE-LOCAL	B		BB		CODELOCAL	GRANTEE'S REPORT OF LOCAL CODES APPLICABLE TO SOLAR PROJECT.
CODE-NATIONAL	B		BB		CODENATL	GRANTEE'S REPORT OF APPLICABLE NATIONAL CODES TO SOLAR PROJECTS.
B. ZONING						
ZONING PERMIT AUTHORITY	B		BB		ZONAUTH	NAME OF AUTHORITY GIVING ZONING APPROVAL.
ZONING PERMIT AUTHORITY ADDRESS	B		BB		ZONCITY ZONSTATE ZONSTREET ZONZIP	ADDRESS OF AUTHORITY GIVING ZONING APPROVAL.
ZONING PERMIT AUTHORITY DATE	B		BB		ZONDATE	DATE ON WHICH ZONING FOR SOLAR BUILDING WAS APPROVED.
ZONING PERMIT PROBLEMS	B		BB	SEE APPENDIX C	ZONPROB	SPECIFIES ANY DESIGN CHANGES REQUIRED IN THE PROCESS OF ACQUIRING ZONING APPROVAL.
C. OCCUPANCY PERMITS						
OCCUPANCY PERMIT APPROVAL DATE	B		BB		OPERDATE	DATE ON WHICH OCCUPANCY PERMIT, IF REQUIRED, WAS APPROVED.
OCCUPANCY PERMIT AUTHORITY	B		BB		OPERAUTH	NAME OF APPROVING CODES AUTHORITY.

IV. INSTITUTIONAL/LEGAL C. OCCUPANCY PERMITS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
OCCUPANCY PERMIT AUTHORITY ADDRESS	B		BB		OPERCITY OPERSTATE OPERSTREET OPERZIP	ADDRESS OF APPROVING CODES AUTHORITY.
OCCUPANCY PERMIT PROBLEMS	B		BB	SEE APPENDIX C	OPERPROB	EXPERIENCE IN SECURING OCCUPANCY PERMIT.

V. MISCELLANEOUS	LEVEL	UNITS	FILE	CODES/VALUES	DATA ELEMENT MIRADS NAME	DEFINITION
CITY CODE	S		FC	UNIV. OF WISC. FCHART CODES FOR CITIES.	CITYCODE	THE CODE FOR THE CITY WHICH WAS USED IN MAKING FCHART CALCULATIONS FOR THE SYSTEM PERFORMANCE.
GRANT AWARD DATE	C		BA		AWARDDATE	THE DATE THE GRANT WAS AWARDED.
GRANTEE REPORT 1 SUBMISSION DATE	C		BA		GR1DATE	THE DATE GRANTEE REPORT 1 WAS SUBMITTED. THIS REPORT IS DUE SHORTLY AFTER GRANT IS AWARDED.
GRANTEE REPORT 4 SUBMISSION DATE	U		BC		GR4DATE	THE DATE GRANTEE REPORT 4 WAS SUBMITTED. THIS REPORT IS DUE WHEN UNIT IS SOLD OR RENTED.

3. CROSS REFERENCES TO THE SOLAR DATA DICTIONARY/DIRECTORY

3.1 Abbreviated Category Code Cross Reference

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Backup efficiency	3
Backup energy type	3
Backup energy type - Grantee Rpt 3	3
Backup energy type - Tech. Desc.	3
Billing frequency	3
Comparative identification	3
Designator No (unit or building)	3
End of billing period	4
Energy consumed	4
Energy cost	4
Energy supplied per non-solar system	4
Meter number	4
Present meter reading	4
Previous meter reading	4
Rate code	4
Start of billing period	4
Surcharge	4
Tax	4
Total cost this period	4
Units of measure	5
Utility company code	5
B. Climate Considerations	
Available insolation	5
Degree days	5
Energy supplied per degree days by system	5
C. Construction Information	
Begin solar installation date	5
Breakage problems	6
Builder address	6
Builder contact name/phone	6
Builder grant number	6
Builder name	6
Builder phone	6
Builder organization	6
Building type	6
Construction beginning date	7

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Construction completion date	7
Delivery problems	7
Grantee Report 3 submission date	7
Labor problems	7
New or retrofit construction	7
Other problems	7
Solar interface problems	7
 D. Design	
Designer address	7
Designer contact name/phone	7
Designer grant award amount - all systems	7
Designer grant number	8
Designer name	8
Designer organization	8
Designer phone	8
Final - design completion date	8
Grantee Report 2 submission date	8
 E. Loads	
Aux contribution	8
Cooling load	8
DHW load	8
Heating load	9
Internal heat load	9
Liquid load correction factor	9
Total cooling load	9
Total DHW load	9
Total heat load	9
Total heating load for this model	9
Total load	10
Total load per year	10
 F. Maintenance	
Date service performed	10
Hardware element serviced	10
Number of similiar problems	10
Performance area serviced	10
Solar owner's manual	10
 G. Repairs	
Project phase	10
Reason for service	11
Repair performed	11

H. Solar Energy System Description

Absorber coating	11
Absorber substrate material	11
Absorber - other	11
Air flow corr factor	11
Auxil tank storage volume (DHW)	11
Auxil tank storage volume (heat)	11
Azimuth angle	12
Back insulation	12
Back insulation R-value	12
Collector aperture area	12
Collector type	12
Comb heat exchange eff - col-stor	12
Comb heat exchange eff - stor-load	13
Conditioned area per bldg	13
Cover plate material	13
Cover plate material description	13
Cover plate thickness	13
C-D	13
Density	13
DHW capacity	13
DHW inlet temp	14
DHW set temp	14
DHW usage	14
Flow rate	14
Fluid passage material	14
Freeze protection	14
FR-prime-tau	14
FP-prime-UL	15
Heat pump nominal capacity	15
Heat pump type	15
Incidence angle modifier	15
Main tank storage medium (DHW)	15
Main tank storage medium (heat)	15
Main tank storage volume (DHW)	15
Main tank storage volume (heat)	15
Net area	16
Number of cover plates	16
Panel intercept	16
Panel slope	16
Pre-heat tank storage volume (DHW)	16
Pre-heat tank storage volume (heat)	16
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Specific heat	17
Storage capacity	17
Storage temp in main tank - lower	17
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System kind	18
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System number (per model)	18
System transfer medium	18
System type	18
Thermal capacitance	18
Tilt angle	18
Total heat loss factor	19
Transport medium	19
Ventilation	19
Water percent by volume	19
I. Solar Energy System Performance	
Aux contribution	19
Project instr	19
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Solar energy system test date	20
Solar fraction	20
Total aux contribution	20
Total solar contribution	20
Total solar fraction	20
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Unit first offered date	21
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Final buying price	21
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Initial rent	21
C. Problems	
Marketing problems	21
D. Market Methods/Effectiveness	
No of visitors	21
Public interest in buying solar	21
E. Prospective Buyers/Renters	
HUD access terms for unit	21
No of buyers	22
F. Solar Project Characteristics	
Application number	22
Cycle	22
Disposition of units	22
Location number	22
Model number (per location)	22
New or retrofit construction	22
Number of buildings	22
Number of solar systems	22
Number of units	23
Project address	23
Project type	23
Sales/rental terms for unit	23
SEA (Standard Economic Area)	23
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3.2 Computer File Cross Reference

3.2.1 Grant File Data Elements

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Energy supplied per non-solar system 4

B. Climate Considerations

Degree days 5

Energy supplied per deg days by sys 5

C. Construction Information

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Builder contact name/phone 6

Builder grant number 6

Builder name 6

Builder phone 6

Builder organization 6

Building type 6

New or retrofit construction 7

D. Design

Designer address 7

Designer contact name/phone 7

Designer grant award amount - all sys 7

Designer grant number 8

Designer name 8

Designer organization 8

Designer phone 8

E. Loads

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H. Solar Energy System Description

Collector aperture area 12

Collector type 12

Conditioned area per bldg 13

Solar energy supplied per yr by sys 16

System function 18

System kind 18

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II. Marketing

F. Solar Project Characteristics

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Location number	22
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Number of buildings	22
Number of solar systems	23
Number of units	23
Project address	23
Project type	23
SEA (Standard Economic Area)	23

G. Solar Energy System Costs

Builder estimated \$ of all systems	23
Builder grant award amount - all sys	23
Cost of one system to gov't	23
Individual system cost	24
\$ requested by builder for all sys	24
\$ requested by designer for all sys	24

III. Financial

A. Construction Financing

Builder financing	25
-------------------	----

3.2.2 Grantee Report File Data Elements

I. Technical Section

a. Auxiliary Energy

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------------------------------------	---

C. Construction Information

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 B. Prices	
Final buying price	21
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Initial rent	21
 C. Problems	
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 D. Market Methods/Effectiveness	
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Public interest in buying solar	21
E. Prospective Buyers/Renters	
HUD access terms for unit	21
No of buyers	22
F. Solar Project Characteristics	
New or retrofit construction	22
Sales/rental terms for unit	23
Unit status	23
<u>III. Financial</u>	
A. Construction Financing	
Construction financing amnt	26
Construction financing date	26
Construction financing org	26
Construction financing org address	26
Construction financing period	26
Construction financing phone	26
Construction financing prob	26
Construction financing date	26
Construction financing status	26
Construction financing type	26
B. Permanent Financing/Mortgage	
Marketing period	26
Mortgage amnt	27
Mortgage approval date	27
Mortgage arranged by	27
Mortgage fees	27
Mortgage period	27
Mortgage problems	27
Mortgage rate	27
Mortgage type	27
Mortgagor	27
Mortgagor address	27
Mortgagor phone	27
<u>IV. Institutional/Legal</u>	
A. Building Codes	
Building permit approval date	28

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Building permit authority	28
Building permit authority address	28
Building permit problems	28
Code based or not	28
Code - local	28
Code - national	28
 B. Zoning	
Zoning permit authority	28
Zoning permit authority address	28
Zoning permit authority date	28
Zoning permit problems	28
 C. Occupancy Permits	
Occupancy permit approval date	28
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Backup energy type	3
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Comparative identification	3
Designator no (unit or building)	3
End of billing period	4
Energy consumed	4
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Meter number	4
Present meter reading	4
Previous meter reading	4
Rate code	4
Start of billing period	4
Surcharge	4
Tax	4
Total cost this period	4

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Units of measure	5
Utility company code	5
3.2.4 Technical Concerns File Data Elements	
<u>I. Technical Section</u>	
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Date service performed	10
Hardware element serviced	10
Number of similar problems	10
Performance area serviced	10
G. Repairs	
Project phase	10
Reason for service	11
Repair performed	11
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<u>I. Technical Section</u>	
A. Auxiliary Energy	
Backup capacity	3
Backup efficiency	3
Backup energy type - tech desc	3
B. Climate Considerations	
Available insolation	5
E. Loads	
Aux contribution	8
Cooling load	8
DHW load	8
Heating load	9
Internal heat load	9
Liquid load correction factor	9
Total cooling load	9
Total DHW load	9
Total heat load	9
Total load	10
Total load per year	10

H. Solar Energy System Description

Absorber coating	11
Absorber substrate material	11
Absorber - other	11
Air flow corr factor	11
Auxil tank storage volume (DHW)	11
Auxil tank storage volume (heat)	11
Azimuth angle	12
Back insulation	12
Back insulation R-value	12
Comb heat exchange eff col-stor	12
Comb heat exchange eff stor-load	13
Cover plate material	13
Cover plate material description	13
Cover plate thickness	13
C-D	13
Density	13
DHW capacity	13
DHW inlet temp	14
DHW set temp	14
DHW usage	14
Flow rate	14
Fluid passage material	14
Freeze protection	14
FR-prime-tau	14
FR-prime-UL	15
Heat pump nominal capacity	15
Heat pump type	15
Incidence angle modifier	15
Main tank storage medium (DHW)	15
Main tank storage medium (heat)	15
Main tank storage volume (DHW)	15
Main tank storage volume (heat)	15
Net area	16
Number of cover plates	16
Panel intercept	16
Panel slope	16
Pre-heat tank storage volume (DHW)	16
Pre-heat tank storage volume (heat)	16
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Source code 9	17
Specific heat	17
Storage capacity	17
Storage temp in main tank - lower	17
Storage temp in main tank - upper	18
System type	18
Thermal capacitance	18
Tilt angle	18
Total heat loss factor	19
Transport medium	19
Ventilation	19
Water percent by volume	19

I. Solar Energy System Performance

Aux contribution	19
Solar contribution	19
Solar fraction	20
Total aux contribution	20
Total solar contribution	20
Total solar fraction	20

V. Miscellaneous

City Code	30
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APPENDIX A

Computer Processing for the Solar Data Dictionary/Directory

The Solar Data Dictionary/Directory (DD/D) of section 2 was produced by a computer program called DD-PROG, written in ANSI COBOL and run on the UNIVAC 1100 Series computer at the National Bureau of Standards. Figure 2 gives a flow chart of the computer processing involved in producing the DD/D.

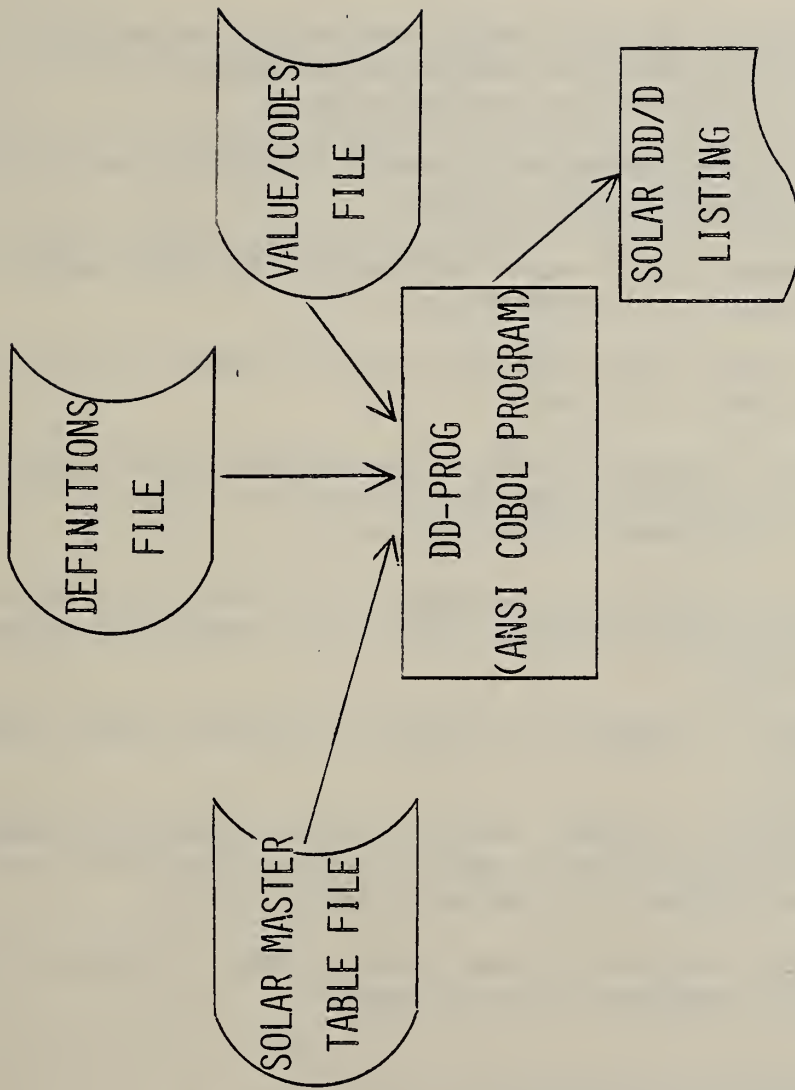
The program requires three input files to operate:

- o Solar Master Table File which contains the name and attributes of each data element to be included in the DD/D;
- o Definitions File which contains the definition for each data element in the Solar Master Table File; and
- o Value/Codes File which contains the list of values and codes for certain data elements in the Solar Master Table File.

The only output from execution of the program is the DD/D, exactly as shown in section 2.

Complete documentation on this program and format layouts for the input files is available from the Solar Data Center at NBS.

Figure 2: Flow Chart of Computer Processing for Solar DD/D



APPENDIX B

Glossary*

- Absorber - The blackened surface in a collector that absorbs the solar radiation and converts it to heat energy.
- Absorber Coating - The painted or treated surface of the absorber which absorbs sunlight (see selective surface).
- Absorber Substrate - That part of the absorber plate to which the surface coating(s) is adhered. In liquid systems, this layer contains the fluid passage tubes.
- Auxiliary Heat - The extra heat provided by a conventional heating system for periods of cloudiness or intense cold, which a solar heating system cannot provide enough.
- Azimuth - The angular distance between true south and the point on the horizon directly below the sun.
- British Thermal Unit or Btu - The quantity of heat needed to raise the temperature of 1 pound of water 1°F.
- Collector - Any of wide variety of devices used to collect solar energy and convert it to heat.
- Cover Plate - A sheet of glass or transparent plastic that sits about an inch above the absorber in a flat-plate collector. The escape of heat is retarded by the cover plate.
- Degree Day - A unit that represents a 1°F deviation from some fixed reference point (usually 65°F) in the mean daily outdoor temperature.
- Double-Glazed - Covered by two panes of glass or other transparent material.
- Heat Exchanger - A device, such as a coiled copper tube immersed in a tank of water, that is used to transfer heat from one fluid to another through an intervening metal surface.
- Heating Load - The rate of heat flow required to maintain indoor comfort; measured in Btu per hour.

*This glossary was compiled from [5, 6, 7].

Heat Pump - An electrically operated machine for heating and cooling. When heating, it transfers heat from one medium at a lower temperature (called the heat source) to a medium at a higher temperature (called the heat sink), thereby cooling the source (outside air) and warming the sink (the house). When cooling, the heat pump functions much like an air conditioner - taking unwanted heat from the heat source (a building) and dumping it to heat sink (the outside).

Heat Storage - A device or medium that absorbs collected solar heat and stores it for periods of inclement or cold weather.

Insulation - A material with high resistance or R-value that is used to retard heat flow.

R-value - The tendency of a material to retard the flow of heat.

Selective Surface - An absorber coating that absorbs most of the sunlight hitting it but emits very little thermal radiation.

Specific Heat - The quantity of heat, in Btu, needed to raise the temperature of 1 pound of a material 1°F.

APPENDIX C

Codes/Values for Certain Data Elements

Introduction

Codes and their values are associated with certain data element names. For example, data element PJINSTR can be coded in two ways: "IN" or "NO". The "values" or "meanings" of these two codes are: "IN" means "instrumented" and "NO" means "not instrumented." Appendix C contains all those codes and values which were too long to fit into the SOLAR DATA DICTIONARY.

The following pages contain a data element name at the top of the page, followed by the name of the interactive file or files which reference this data element, followed by the codes and their corresponding values. The data elements are in alphabetical order. The codes/values lists are usually alphabetical with the exception of EVENTS and HARDELEM.

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS

Data Element Name: ACTIONS

ADED ADDED
ADED1 ANTIFREEZE
ADED2 FLUID
ADED3 INHIBITOR
ADED4 ADDITIONAL HARDWARE
ADED5 ADDITIONAL MEMBERS
ADJT ADJUST
ADJT1 BLEED
ADJT2 CLEAN
ADJT3 THAW
ADJT4 TIGHTEN
ADJT5 LUBRICATE
BRAZ BRAZE
ELIM ELIMINATE
NONE NONE
NBAR NONE BUT ACTION REQD
NBAR1 AWAITING SHIPMT OF RPLMT ELEMENTS
MANI MANFTR INVESTG
OCIN OCCUPANT INSTRUCTED
OCIN1 ON PROPER USE OF SYS
OCIN2 ON RELSHP-FENES/ECON
RECT RECOAT
REGR REGROUTED
REMV REMOVE
REPK REPACK
REPA REPAINT
REPR REPAIR
RPLI REPLACE W/ IDENT ITEM
RPLI1 LEVEL 1
RPLI2 LEVEL 2
RPLI3 LEVEL 3
RPLI4 LEVEL 4
RPLS REPLACE W/SUB ITEM
RPLS1 LEVEL 1
RPLS2 LEVEL 2
RPLS3 LEVEL 3
RPLS4 LEVEL 4
RELO RELOCATE
RESL RESEAL
RETP RETAPE
REWK REWORK
REWR REWIRE
RSMA ROU OR SCHD MAIN
SLDR SOLDER
WELD WELD
NBAR2 WAITING OPPORTUNE TIME
REMV1 ISOLATE FROM SYSTEM

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER

AL01 Huntsville Utilities
P.O. Box 2048
Huntsville, AL 35804

AZ01 Arizona Public Service Co.
P.O. Box 2907
Phoenix, AZ 85062

CA01 Pacific Gas & Electric Co.
111 Almaden Blvd.
San Jose, CA 95198

CA02 Pacific Gas & Electric Co.
314 "F" Street
Davis, CA 95616

CA03 San Diego Gas & Electric Co.
P.O. Box 1831
San Diego, CA 92112

CA04 So. California Gas Co.
340 N. Juanita St.
Hemet, CA 92343

CA05 California Edison Co.
10180 Telegraph Rd.
Ventura, CA 92343

CO01 Public Service Co. of Colorado
P.O. Box 840
550 15th St.
Denver, CO 80202

CO02 Public Service Co. of Colorado
1155 Canyon Blvd.
Box 551
Boulder, CO 80302

CO03 Public Service Co. of Colorado
HWY 74
P.O. Box 640
Evergreen, CO 80439

CO05 Union Rural Electric Assn.
P.O. Box 359
Brighton, CO 80601

APPENDIX C

CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

C005 Public Service Co. of Colorado
P.O. Box 707
Frisco, CO 80443

C006 Public Service Co. of Colorado
9722 E. 16th St.
Aurora, CO 80010

C007 Public Service Co. of Colorado
209 S. Meldrum St.
Box 1668
Fort Collins, CO 80521

CT01 Hartford Electric Light Co.
34 Hopmeadow
Simsburg, CT 06070

CT02 The United Illuminating Co.
80 Temple Street
New Haven, CT 06506

CT03 Hartford Electric Light Co.
P.O. Box 2370
New Haven, CT 06506

CT04 Connecticut Light & Power
King Street
Enfield, CT 06082

FL01 Florida Power Corp.
P.O. Box 33733
St. Petersburg, FL 33152

FL02 Florida Power & Light Company
P.O. Box 529100
9520 W Flager
Miami, FL 33152

FL03 Florida Power & Light Company
P.O. Box 341608
Coral Gables, FL 33134

FL04 City of Gainesville Utilities
200 E. University Ave. Rm 402
Gainesville, FL 32602

APPENDIX C

CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

FL05 Florida Public Utilities Co.
Drawer C
West Palm Beach, FL 33406

GA01 Coweta/Fayette, Inc.
P.O. Box 488
Newnan, GA 30264

GA02 Atlanta Gas Light
89 Annex
Atlanta, GA 30389

GA03 Georgia Power Company
1790 Montreal Circle
Tucker, GA 30084

GA04 Georgia Power Company
96 Annex
Atlanta, GA 30396

GA05 Georgia Power Company
Duluth, GA 30246

GA06 Buford Gas Company
30 Garnett Street
Buford, GA 30518

GA07 Georgia Power Company
P.O. Box 327
Lawrenceville, GA 30246

GA08 Georgia Power Company
P.O. Box 271
Canton, GA 30114

GA09 Jefferson Electric Company
1001 Peachtree Street
Louisville, GA 30434

HI01 Hawaiian Electric Co., Inc.
P.O. Box 3978
Honolulu, HI 96813

IN01 Public Service of Indiana
105 S. Madison
Greenwood, IN 46142

APPENDIX C

CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

MA01 Bay State Gas Co.
2025 Roosevelt Avenue
Springfield, MA 01101

MA02 Boston Edison Company
P.O. Box 488
Boston, MA 02199

MA03 Bay State Gas Company
120 Royall Street
Canton, MA 02021

MA04 Bay State Gas Company
995 Belmont Street
Brocton, MA 02401

MD01 Baltimore Gas & Electric Co.
1508 Woodlawn Drive
Baltimore, MD 21207

MI01 Berrien City Farm Bureau Oil Co.
M-140 & M-62
Eau Claire, MI 41911

MN01 Minnegasco/Minnesota Gas Co.
626 Nicollet Mall
Minneapolis, MN 55402

MN02 Northern States Power
414 Nicollet Mall
Minneapolis, MN 55401

MO01 The Gas Service Co.
2460 Pershing Rd.
Kansas City, MO 64108

MO02 Kansas City Power & Light Co.
13330 Baltimore Avenue
Kansas City, MO 64145

NC01 Duke Power Company
Drawer A D Salem Station
Winston-Salem, NC 27108

NE01 Cengas/Minnesota Gas Co.
1201 N Street
Lincoln, NE 68512

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

NH01 Public Service Co. of New Hampshire
Crystal Avenue
Derry, NH 03038

NH02 Public Service Co. of New Hampshire
370 Amherst Street
Nashua, NH 03061

NH03 New Hampshire Elec. Cooperative, Inc.
Red 2 Tenney Mt. Hwy.
Plymouth, NH 03264

NM01 Gas Co. of New Mexico
P.O. Box 1692
Albuquerque, NM 87103

NM02 Public Service Co. of New Mexico
414 Silver Ave. N.W.
Albuquerque, NM 87103

NM03 Public Service Co. of New Mexico
124 E. Marcy
Santa Fe, NM 87501

NY01 New York State Electric & Gas
5655 South Park Ave.
Hamburg, NY 14075

NY02 National Fuel Gas
455 Main Street
Buffalo, NY 14203

NY03 Orange & Rockland Electric & Gas Co.
One Bluehill Plaza
Peael River, NY 10965

NY04 Niagara Mohawk Power
383 Broadway
Saratoga Springs, NY 12866

NY05 Moore Oil Company
Charlton Road
Ballston Spa, NY 12020

OH01 Cincinnati Gas & Electric Company
139 E. 4th
Cincinnati, OH 45201

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

OH02 Ohio Power Company
Box 630
Canton, OH 44701

OH03 Columbus & Southern Ohio Electric Co.
215 North Front Street
Columbus, OH 44701

OR01 Pacific Power & Light Co.
300 W. Anderson Avenue
Coos Bay, OR 97420

OR02 Ashland Municipal Electric
20 E. Main
Ashland, OR 97420

PA01 Philadelphia Electric Co.
230 Market Street
Philadelphia, PA 19101

SC01 Palmetto Elec Cooperative, Inc.
Box 1218
Hilton Head, SC 29928

SC02 Piedmont Natural Gas Co., Inc.
P.O. Box 1905
Greenville, SC 29602

SC03 South Carolina Electric and Gas
P.O. Box 764
Columbus, SC 29218

TN01 Memphis Light, Gas & Water Co.
P.O. Box 430
Memphis, TN 29218

TX01 El Paso Electric Co.
P.O. Box 982
El Paso, TX 79999

TX03 Lone Star Gas
301 Harwood St.
Dallas, TX 75201

TX04 Dallas Power & Light Co.
1506 Commerce Street
Dallas, TX 75201

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: AUXSUPPLIER (Continued)

- TX05 West Texas Utilities
106 S. Chadbourne
San Angelo, TX 76901
- TX06 Lone Star Gas Company
P.O. Box 471
San Angelo, TX 76902
- UT01 Utah Power & Light Company
1407 West North Temple St.
Salt Lake City, UT 84116
- UT02 Logan Power & Light Co.
61 W. 100 N.
Logan, UT 84321
- UT03 Mountain Fuel
45 E. 200 N.
Logan, UT 84321
- VA01 Appalachian Power Company
523 Main Street
Lynchburg, VA 24506
- WI01 Wisconsin Power & Light Co.
401 Oak Street
Baraboo, WI 53913
- WI02 Northern States Power Company
P.O. Box 1147
Eau Claire, WI 54701
- WI03 Wisconsin Electric
231 W. Michigan Street
Milwaukee, WI 53201

APPENDIX C

CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: BPERPROB

- A NONE
- B BLDG. DEPT. CODE PROHIBIT SOLAR
- C CODES DON'T ADDR SOLAR CAN'T ISSUE
- D BLDG. DEPT. REQ. REDESIGN OF SOLAR
- E WILL NOT ISSUE NON SOLAR CAUSE
- F PERMIT NOT REQ. RETROFIT
- G PERMIT NOT REQ.
- H 100% COMPLETION REQ. TO ISSUE
- I BLDG. DEPT. SHOWED INTEREST
- J OTHER SEPARATE PERMITS REQ'D.
- K ADDS/CHANGES TO BLDG. REQ'D.
- L OBTAINED BY OTHER THAN GRANTEE
- Z MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)
Data Element Names: CFINPROB

A NO PROBLEM
B FIN. ORG. NEG ON SOLAR
C FIN. ORG. HAS TECH CONCERNS
D FIN. ORG. HAS MARKET CONCERNS
E FIN. ORG. NOT MAKING CONST. LOANS
F INCR. INT. RATE DUE TO SOLAR
G CONST./MORTGAGE COMBINED
H HUD FINANCED
I RETROFIT INTERNAL FIN.
J APPRAISAL PROBLEMS
K LOAN LESS THAN APPR. VALUE
L COND. COMMIT. NON SOLAR
M COND. COMMIT. SOLAR CAUSED
N PENDING FHA/VA APPROV.
O REVOLVING CREDIT LINE
P INTERNAL FUNDING
Q RETROFIT NO FIN. REQ.
R CONST. & PERMANENT FIN.
S GRANT AMT. INCL. IN SALES PRICE
T STATE FUNDS
U LOW INC. HSG LOAN ONLY
Z MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: CPROBBRK

- A NONE
- B IMPROPER HANDLING DEL. OR ON SITE
- C EQUIP. TOO FRAGILE
- D FAULTY MANUFACTURE
- E OPERATIONAL FAILURE
- F DAMAGED OR INSTALLED INCORRECTLY
- G FAULTY EQUIP REPLACED
- H DEFECTIVE HOSES/DAMPERS/FANS
- I INST. MANUALS NOT PROVIDED
- J MALFUNCTIONING CONTROLS
- K ALL COLLECTORS/PANELS REPLACED
- L LEAKAGE PROBLEMS
- M MISC. COLLECTOR BREAKDOWNS
- N STORAGE PROBLEMS
- O DAMAGED IN TRANSIT
- Z MORE INFO. IN FILES

APPENDIX C

CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: CPROBDEL

A NONE
B TEMP. PROD. DELAY
C MAJOR PROD. DELAY CHANGE OF EQUIP.
D DEL. DELAY DUE TO WEATHER
E DEL. DELAY CAUSE UNSPECIFIED
F COMPANY OUT OF BUSINESS
G MORE LEAD TIME REQ'D ON ORDERS
H HUD/BOEING INSTR. PACKAGE DELAYED
I INCOMPLETE ORDER
J DELAYED AT CUSTOMS
K DISPUTE CONTRACTORS & MFG.
L LOCAL SUPPLIER OUT OF MATERIALS
M MISC. PARTS REORDERED
N MISC. MATERIALS UNAVAILABLE
O ORDER REC'D W/WRONG COMPONENTS
P PLANT SHUTDOWN/STRIKE
Q REORDER/DAMAGED PARTS REC'D
S SUPPLIER UNABLE TO SHIP PER SCHED.
T TRANSPORTATION RELATED DELAY
U MAJOR PARTS REORDERED
V FABRICATION DELAY
Z MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: CPROBINTF

A NONE
B MAJOR STRUCTURAL CHANGES
C MINOR STRUCTURAL CHANGES
D WEATHER
E AESTHETIC PROBLEMS
F FURTHER CONST. AFTER COMPL.
G ADD'L MAT./COMPONENTS REQD.
H IMPROPER DESIGN ROOF OR COLL.
I INSULATION RELATED
J ACQUISITION OF MATERIALS
K ADD'L DUCT WORK REQD.
L LEAKS
M MULTIPLE INTERFACE PROBLEM
N NEW DESIGN DEV. & INSTALLED
O ROOF DESIGN CREATED PROBLEMS
P SOLAR MFG. RECOMMENDS CHANGE
Q ROOF DESIGN CREATED PROBLEMS
R SOLAR PLUMB./WIRING RELATED
S SENORS OMITTED
T TRUSS DESIGNS ADDED
U STORAGE TANK MODS.
V SCHEDULING OF OTHER SUBCONT.
W WATERPROOFING
Y SOLAR INSTALL. PROBLEMS
Z MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: CPROBLAB

A NONE
B NO INTEREST WILL NOT WORK SOLAR
C LACK OF SKILL
D JURISDICTIONAL DISPUTE
E POOR WORKMANSHIP
F LACKS TECH. COMPETANCE
G WEATHER RELATED
H HAD TO TRAIN CO. PERSONNEL
I INTITAL CONTR. TERMINATED
J SLOW PYMNT SLOW LAB. RESPONSE
K EXTRA SUPERVISION REQ.
L INSTALLATION COSTS OVER ESTIMATE
M MORE INSTR. FROM SOL. MFG.
N NOT AVAIL TO COMPL. WORK
O SUBCONTR. BEHIND SCHEDULE
P LAB. PRODUCTION DEL. UNSPECIFIED
Q ACQUIRING QUALIFIED LABOR
R UNSKILLED PROSPECTIVE OWNERS
S HIGH LABOR COSTS
Z MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: CPROBOTH

A NONE
B PROB. W/GEN. CONTR. & SUBCONTR.
C RELATED TO COSTS
D SUBCONTR. WORKING OTHER JOBS
E ROOFING COORDINATION
F MISC. WEATHER RELATED
G VANDALISM/THEFT
H MODIFICATIONS AFTER COMPL.
I OBTAINING GEN. MATERIALS
J ROCK BOX/FILL/STORAGE
K INSTRUMENTATION INSTALLATION
L CONSTRUCTION START DELAY
M INSTALL. TIME UNDERESTIMATED
N MAJOR CONSTRUCTION PROBLEMS
O UNFAMILIAR W/SOLAR COMPONENTS
Z MORE INFORMATION IN FILES

APPENDIX C

CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: EVENTS

GENE	GENERAL
AIRE	AIR ENTRAPMENT
DMBY	DAMAGED
DMBY1	ACCIDENT
DMBY11	IN TRANSIT
DMBY12	DURING INSTALLATION
DMBY2	FREEZING OF LIQUID
DMBY3	LEAKAGE OF MOISTURE OR RAIN
DMBY4	LEAKAGE OF SYSTEM FLUIDS
DMBY41	BETWEEN COMPONENTS
DMBY42	FROM COMPONENTS
DMBY5	LIGHTNING
DMBY6	MAINTENANCE ACTION
DMBY7	SOIL EROSION
DMBY71	OVERFLOW PROVISIONS INADEQUATE
DMBY72	STORM DRAINS INADEQUATE
DMBY8	VANDALISM
DESC	DESIGN CHANGE
FLOP	FAILED TO OPERATE
FLOP1	BROKEN
FLOP2	BURNED OUT
FLOP3	BURST
FLOP4	CLOGGED OR BLOCKED
FLOP7	FAULTY
FLOP6	INCOMPATIBLE
FLOP8	MALF-OTH COMPO
FLOP5	WORN OUT
FLBO	FAILED TO OPERATE BECAUSE OF OUTAGE
FLBO1	ELECTRICITY
FLBO2	GAS
FLBO3	OIL
FLBO4	WATER
OPIM	OPERATING, BUT IMPROPERLY
OPIM6	CONTINUOUSLY
OPIM1	DEPOSITION OF
OPIM11	CONDENSATION PRODUCT
OPIM111	MOISTURE
OPIM112	SOLID
OPIM12	DUST OR DIRT ON EXTERIOR SURFACES
OPIM13	DUST OR DIRT ON INTERIOR SURFACES
OPIM14	GUM OR VARNISH
OPIM15	PRECIPITATED MATTER
OPIM16	SEDIMENTATION
OPIM4	ELEMENT INADEQUACIES
OPIM2	INCORRECT
OPIM21	ADJUSTMENT
OPIM22	ALIGNMENT
OPIM23	CAPACITY
OPIM24	INSTALLATION
OPIM25	MANUFACTURING

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: EVENTS (Continued)

OPIM26 PART OR COMPONENT
OPIM3 LEAKAGE OF AIR
OPIM5 SOLAR SHADING
OPIM51 OFF-SITE OBSTRUCTION
OPIM52 ON-SITE OBSTRUCTION
RUBN RESTRAINS USE BECAUSE OF NOISE
RUBN1 FLUID MOVEMENT
RUBN2 VIBRATION
RUBN3 WATER HAMMER
RULS RESTRICTS USE OF LIVING SPACE
RULS1 ENCROACHMENT
RULS2 EXCESSIVE AIR MOVEMENT
RULS3 LEAKAGE OF AIR
RULS4 ODORS
RULS5 SOLAR REFLECTION
RULS6 THERMAL RADIATION
RUOS RESTRICTS USE OF OUTDOOR SPACE
RUOS1 FLUIDS ESCAPING
RUOS2 SOLAR REFLECTION
RUOS3 THERMAL RADIATION
SCHD SCHEDULING INADEQUACIES
SHPM SHPMT/PARTS & MATERIALS INCOMPLETE
MECH MECHANICAL
FLIN FILTRATION INADEQUATE
FLRA FLOW RATE
FLRA1 HIGHER THAN DESIGN
FLRA2 LOWER THAN DESIGN
FLRG FLOW REGULATION INADEQUATE
FLRG1 CYCLING EXCESSIVE
FLSD FLOW SEQUENCING NOT ACCORDING TO DESIGN
FLSD1 DIRECTION
FLSD2 SCHEDULING
FLUN FLOW UNBALANCED
FLVE FLUID VOLUME EXCESSIVE
FLVE1 BOILING PROVISIONS INADEQUATE
FLVE2 THERMAL EXPANSION PROVISIONS INADEQUATE
FRIC FRICTION EXCESSIVE
FRIC1 FOREIGN MATTER
FRIC2 IMPROPER MATERIALS
FRIC3 INADEQUATE BEARING SURFACES
FRIC4 INADEQUATE CLEARANCE
FRIC5 INADEQUATE LUBRICATION
INST INSTALL DIF
INST1 HARDWARE INADEQUATE
INST2 INSTRUCTIONS INADEQUATE
INST3 BUILDING INADEQUATE
LGRU LEAKAGE RUNOFF PROVISIONS INADEQUATE
LEAK LEAKING
OPIN OVERFLOW PROVISIONS INADEQUATE
OVL D OVERLOADED

APPENDIX C
 CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: EVENTS (Continued)

OVLD1	ELECTRICALLY
OVLD2	MECHANICALLY
PASS	PASSAGE SIZE
PASS1	LARGER THAN DESIGN
PASS2	SMALLER THAN DESIGN
PBHD	PRESSURE BUILDUP HIGHER THAN DESIGN
PBHD1	DURING NO FLOW CONDITIONS
PBHD2	DURING NORMAL OPERATING CONDITIONS
PROP	PRESSURE DURING OPERATION
PROP1	HIGHER THAN DESIGN
PROP2	LOWER THAN DESIGN
PRIN	PRESSURE REGULATION INADEQUATE
PREF	PRESSURE RELIEF INADEQUATE
SUPI	SUPPORT INADEQUATE
SUPI1	CAUSING IMPROPER DRAINAGE
SUPI2	CAUSING JOINT FAILURE
SUPI3	LOW SPOTS OR SAGGING
TMOV	THERMAL MOVEMENT
TMOV1	CONTRACTION EXCESSIVE
TMOV2	DIFFERENTIAL DISPLACEMENT EXCESSIVE
TMOV3	EXPANSION EXCESSIVE
VHDE	VACUUM HIGHER THAN DESIGN
VHDE1	BECAUSE OF INADEQUATE RELIEF
VLDE	VACUUM LOWER THAN DESIGN
VLDE1	BECAUSE OF OUTGASSING
VLDE2	BECAUSE OF LEAKAGE
VIBE	VIBRATION EXCESSIVE
VIBE1	INADEQUATE/NO VIBRATION ISOLATORS
VIBE2	INADEQUATE/NO WATER HAMMER ARRESTORS
VLIN	VOLUME INSUFFICIENT
VLTL	VOLUME TOO LARGE
MAIN	MAINTAINABILITY
ACRE	ACCESS FOR REPAIRS INADEQUATE
ACRU	ACCESS FOR ROUTINE MAINTENANCE INADEQUATE
BYPA	BY PASSES OR SHUT-OFFS INADEQUATE
FAMA	FACILITIES FOR MAINTENANCE INADEQUATE
FAMA1	USE OF ELECTRICAL MAINTENANCE EQUIPMENT
FAMA2	WASTE DISPOSAL
MAST	MAINTENANCE INSTRUCTIONS
MAST1	INADEQUATE
MAST2	NOT AVAILABLE
MAEP	MAINTENANCE EQUIPMENT
MAEP1	INADEQUATE
MAEP2	NOT AVAILABLE
RERP	REMOVAL AND/OR REPLACEMENT DIFFICULT
RPDR	REPAIR PROCEDURES
RPDR1	ARE CUMBERSOME
RPDR2	REQUIRES UNAVAILABLE SKILLED PERSONNEL
RNAV	REPLACEMENT NOT AVAILABLE
RSNP	ROUTINE SCHEDULED MAINTENANCE NOT PERFORME

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: EVENTS (Continued)

TCHP	TEST CHECK POINTS
TCHP1	INACCESSIBLE
TCHP2	LACKING
DURA	MATERIALS DURABILITY/RELIABILITY
ANTF	ANTIFREEZE DETERIORATION
ATAC	ATTACK BY
ATAC1	AIRBORNE POLLUTANT OF
ATAC11	HYDROGEN CHLORIDE [HCL]
ATAC12	NITROGEN OXIDES [NOX]
ATAC13	OZONE
ATAC14	SALT SPRAY
ATAC15	SULPHUR DIOXIDE
ATAC16	OTHER
ATAC2	FUNGI
ATAC3	SOIL
ATAC4	ULTRA VIOLET RADIATION
ATAC5	VERMIN
CBCB	CORROSION
CBCB1	DECOMPOSITION PRODUCT AND METAL
CBCB2	DISSIMILAR METALS
CBCB3	FLUID + DISSIMILAR METALS
CBCB4	FLUID AND METAL
DETR	DETERIORATION
DETR1	BLOATING
DETR2	BOND FAILURE
DETR3	DEPOSITION OF OUTGASSED VOLATILES
DETR4	EMBRITTEMENT
DETR5	LOSS OF HOMOGENEITY
DETR51	PRECIPITATION
DETR52	SEGREGATION
DETR53	SHRINKAGE
DETR6	MOISTURE BUILDUP
DETR7	PH CHANGE
DETR8	PLASTIC FLOW
DETR9	SOFTENING
EROD	EROSION
EROD1	BY AIRBORNE PARTICULATE
EROD2	BY FLUID
EROD3	BY FOREIGN MATTER
FAIL	FAILED
FAIL1	CREEP RUPTURE
FAIL2	EXCESSIVE DIMENSIONAL CHANGE
FAIL3	FREEZING
FAIL4	MOISTURE DEGRADATION
FAIL5	THERMAL CYCLING
FAIL6	THERMAL DEGRADATION
FAIL7	THERMAL SHOCK
FAIL71	COLD FLUID ON HOT SURFACE
FAIL72	HOT FLUID ON COLD SURFACE
FAIL73	VIOLENT BOILING

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: EVENTS (Continued)

FAIL8	WET-DRY CYCLING
FAIL9	OUTGASSING OF VOLITALS
SRDG	SURFACE DEGRADATION
SRDG1	BLISTERING
SRDG2	CRACKING
SRDG3	DISCOLORATION OR STAINING
SRDG4	PITTING
SRDG5	PEELING
VISC	VISCOSITY CHANGE
SAFE	SAFETY
EGEM	EGRESS, EMERGENCY
EGEM1	BLOCKED
EGEM2	INADEQUATE
EGEN3	LACKING
EXED	EXPOSED SHARP EDGES
FIRE	FIRE POTENTIAL FIRE DAMAGE
FIRE1	AUTO IGNITION TEMPERATURE EXCEEDED
FIRE2	ELECTRICAL ARCING AND/OR SHORT
FIRE3	FIRE STOPS INEFFECTIVE OR MISSING
FIRE4	FLASH POINT TEMPERATURE EXCEEDED
FIRE5	INADEQUATE CLEARANCE
FIRE51	BETWEEN COMBUSTIBLES + HOT HARDWARE
FIRE52	BETWEEN FLAMMABLE FLUID AND SPARK SOUR
FIRE6	OVERHEATED EQUIPMENT
PRSL	PERSONAL INJURY
PRSL1	ALLERGY
PRSL2	BROKEN BONE
PRSL3	BURN
PRSL4	CUT
PRSL5	ELECTRIC SHOCK
PRSL6	POISONED
PRSL7	SCRATCH
PRSL8	STRAIN
PRSN	PERSON INJURED
PRSN1	OCCUPANT
PRSN2	MAINTENANCE PERSON
PRSN3	PASSER BY
SAHD	SAFETY HAZARDS [OTHER THAN FIRE]
SAHD1	ACCESS, EMERGENCY
SAHD11	BLOCKED
SAHD12	INADEQUATE
SAHD13	LACKING
SAHD2	CONTACT POSSIBLE WITH
SAHD21	HOT FLUIDS
SAHD22	HOT SURFACES
SAHD23	TOXIC SUBSTANCE
SAHD231	INHALATION
SAHD232	DRINKING
SAHD233	SKIN CONTACT
SHEM	SHUTOFFS, EMERGENCY

APPENDIX C
 CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: EVENTS (Continued)

SHEM1	INACCESSIBLE
SHEM2	INCONSPICUOUS
SHEM3	LACKING
CNSL	SOIL CONTAMINATION
SLRA	SOLAR RADIATION CONCENTRATION
CNSW	WATER SUPPLY, POTABLE, CONTAMINATION
CNSW1	DIRECT CONTACT WITH TOXIC MATERIAL
CNSW2	LACK OF SEPARATION OF CIRCULATION LOOPS
CNSW3	IMPROPER DESIGN OF TOXIC FLUID DISCHARGE
CNSW4	TOXIC FLUID LEAKAGE OR OVERFLOW
MPPR	MOVING PARTS INADEQUATELY PROTECTED
STRU	STRUCTURAL
DEFL	DEFLECTIONS WERE EXCESSIVE
DEFL1	HORIZONTALLY
DEFL2	VERTICALLY
DCHG	DIMENSIONAL CHANGES EXCESSIVE
DCHG1	CREEP
DCHG2	DIFFERENTIAL SETTLEMENT
DCHG3	DRYING/SHRINKAGE
DCHG4	MOISTURE EXPANSION
DCHG5	THERMAL EFFECTS
FDLB	FAILURE
FDLB1	BENDING
FDLB2	BUCKLING
FDLB3	BULGING
FDLB4	FATIGUE
FDLB7	FLOTATION
FDLB5	FRACTURE
FDLB51	BRITTLE
FDLB52	DUCTILE
FDLB6	YIELDING
FDLB61	AXIAL
FDLB62	TRANSVERSE
LLOD	LIVE LOADS
LLOD1	EQUIPMENT [SOLAR HARDWARE]
LLOD2	HAIL
LLOD3	ICE
LLOD4	MAINTENANCE EQUIPMENT OR ACTIONS
LLOD5	PONDING OF WATER
LLOD6	SNOW
LLOD7	VEHICLE
LLOD8	WIND
LLOD81	BUFFETING
LLOD82	HORIZONTAL
LLOD83	UPLIFT
LLOD84	VORTEX SHEDDING
LLOD9	INSTALLATION PERSONNEL
LOBY	OVERLOADED
LOBY1	ACCIDENTAL LOADS
LOBY11	ANIMAL

APPENDIX C
 CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: EVENTS (Continued)

LOBY12	DEBRIS, FALLING
LOBY13	DEBRIS, WIND BLOWN
LOBY14	HUMAN
LOBY15	VEHICLE
LOBY2	DEAD LOADS
LOBY3	EXTREME ENVIRONMENTAL LOADS FROM
LOBY31	EARTHQUAKE
LOBY32	FLOOD
LOBY33	HURRICANE
LOBY34	TORNADO
THER	THERMAL
TCAP	CAPACITY
TCAP1	TOO SMALL
TCAP2	MISMATCHED
TCIR	CIRCULATION OF AIR, INDOOR SPACE
TCIR1	TOO HIGH
TCIR2	TOO SMALL
TCON	CONDUCTION, THERMAL
TCON1	TOO HIGH
TCON2	TOO LOW
TCLG	COOLING INADEQUATE
TERA	ENERGY EXCHANGE RATE
TERA1	TOO HIGH
TERA2	TOO LOW
TSIR	ENERGY, SOLAR
TEAX	ENERGY USE, AUXILIARY, TOO HIGH
TEOH	ENERGY USE, OPERATING, TOO HIGH
TSIR1	CONTRIBUTION TO LOAD TOO LOW
TSIR2	CONVERSION EFFICIENCY TOO LOW
TSIR3	DISSIPATION RATE TOO LOW
HGIN	HEATING INADEQUATE
HWSP	HOT WATER SUPPLY IS INADEQUATE
HWSP1	DRAW RATE TOO HIGH
HWSP2	RECOVERY RATE TOO LOW
HUMD	HUMIDITY, INDOOR AIR
HUMD1	HIGHER THAN DESIGN VALUE
HUMD2	LOWER THAN DESIGN VALUE
OCIM	OCCUPANT USE IMPROPER
OCIM1	INEFFICIENT SCHEDULING OF LOAD DEMANDS
OCIM2	THERMOSTAT SET POINT
OCIM21	TOO HIGH
OCIM22	TOO LOW
OPTP	OPTICAL PROPERTIES INADEQUATE
OPTP1	ABSORPTANCE
OPTP11	TOO HIGH
OPTP12	TOO LOW
OPTP2	EMITTANCE TOO HIGH
OPTP3	REFLECTANCE, SOLAR, TOO HIGH
OPTP4	TRANSMITTANCE TOO LOW
ORAN	ORIENTATION ANGLE

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: EVENTS (Continued)

ORAN1 TOO FAR EAST
ORAN2 TOO FAR WEST
RSLR RADIATION, SOLAR
RSLR1 EXCESSIVE
RSLR2 INADEQUATE CONTROL
RSLR3 INSUFFICIENT
RTHL RADIATION, THERMAL
RTHL1 TOO HIGH
RTHL2 TOO LOW
THPG TEMPERATURE, HARDWARE OPERATING,
THPG1 DURING NOCTURNAL OPERATION
THPG11 TOO HIGH
THPG12 TOO LOW
THPG2 DURING NO FLOW CONDITION
THPG21 TOO HIGH
THPG22 TOO LOW
THPG3 DURING NORMAL OPERATION
THPG31 TOO HIGH
THPG32 TOO LOW
THPG4 DURING FILL
THPG41 TOO HIGH
THPG42 TOO LOW
TAIR TEMPERATURE, OUTDOOR AIR
TAIR1 HIGHER THAN DESIGN VALUE
TAIR2 LOWER THAN DESIGN VALUE
TSTP TEMPERATURE SET POINTS,
TSTP1 DIFFERENTIAL
TSTP11 TOO HIGH
TSTP12 TOO LOW
TSTP3 HIGHER THAN DESIGN VALUE
TSTP4 LOWER THAN DESIGN VALUE
TLTA TILT ANGLE
TLTA1 TOO HIGH
TLTA2 TOO LOW
THMOSY THERMOSYPHONING

APPENDIX C
 CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: HARDELEH

(67)

SELD	SITE/BUILDING
SITE	SITE
SUDR	SURFACE DRAINAGE
UTIL	UTILITIES
WATR	WATER
ELEC	ELECTRIC
SWER	SEWER
FUEL	FUEL
SOIL	SOIL
PLTR	PLANTS/TREES
ADST	ADJACENT STRUC
BLDG	BUILDING
ROOF	ROOF
ROFC	ROOFING
INSU	INSULATION
STRE	STRUCTURE
CEIL	CEILING
WALL	WALL
INTR	INTERIOR
EXTR	EXTERIOR
FLOC	FLOOR
BSMT	BASEMENT
OPNG	OPERINGS
DOOR	DOOR
WLDW	WINDOW
OTER	OTHER
SBSY	SBS-H/C/HW-ACT/PASS
ACSD	T W/DISC SBS
COLA	COLLECTOR ARRAY
COLU	COLLECTOR UNITS
COVA	COVER ASSY
HTRP	HEAT TRAP
ABAS	ABSORBER ASSY
THRM	THERMAL INSUL
DESA	DESICCANT
INUR	INT UNIT REF
CASA	CASE ASSY
HCON	HEADERS-CONNECTORS
AIRD	AIR DUCT ASSY
LPIP	LIQUID PIPE ASSY
EXRA	EXTR REF ARRAY
REFA	REFLECTOR ARRAY
RINS	INSULATION
MTGS	MOUNTING STRUC
SUPS	SUPTG STRUC
FIXM	FIXED MOUNT
SADJ	SEASON ADJ MOUNT

APPENDIX C
 CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: HARDELEM (Continued)

TKGM	TRACKING MOUNT
ENCL	ENCLOSURE
TRST	THERMAL STORAGE
TKCU	TANK/CONTN UNITS
SMCV	STOR MED CONTN VL
VS LC	VESSEL LIN/COAT
GASK	GASKETS/SEALANTS
THIA	INSULATION ASSY
STEL	STRUC ELEMENTS
INRT	INT RACKS/TROUGHS
STMD	STORAGE MEDIUM
STLQ	LIQUID
STRK	ROCK
HTEX	HEAT EXCHANGERS
CLST	COLLECTOR TO STOR
STLD	STORAGE TO LOAD
ENTP	ENERGY TRANSPORT
LISY	LIQUID SYSTEMS
HTRS	HEAT TRANSFER LIQ
PIAS	PIPING ASSY
PUMP	PUMPS
LFIL	FILTERS
VALV	VALVES
ELIN	INSULATION
AIRS	AIR SYSTEMS
DUCA	DUCT ASSY
BLOW	BLOWERS
AFIL	FILTERS
DAMP	DAMPERS
EAIN	INSULATION
CONT	CONTROLS
LSMC	LLD SUP MODE CONT U
LCLS	CONTROL LOGIC SELECTOR
LSEN	SENSORS (L S)
LADV	ACTUATED DEV (L S)
CSFL	COL/STOR FLOW CONT U
CDTC	DIFF THERMOSTAT CONT
CSEN	SENSORS (T C)
CADV	ACTUATED DEV (T C)
ETOR	ENERGY TRANS OPRN REGS
EPRG	PRESSURE REGULATORS
EFRG	FLOW REGULATORS
SFSC	SSVS FAIL-SAFE CONT
SPRV	PRES RELIEF VALVES
STRV	TEMP RELIEF VALVES
SEOP	ELEC OVERLOAD PROTEC
SVRV	VACUUM RELIEF VALVES

APPENDIX C
 CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: HARDELEM (Continued)

SCVA	CHECK VALVES
SADV	AUTO DRAINDOWN VALVES
SWHA	WATER HAMMER ARRES
SABV	AUTO BACKFILL VALVES
SBFP	BACK FLOW PREVENTORS
CMPC	COMPONENT OPRN CONTS
TMDC	TRACKING MOUNT DRIVE CONTS
STHT	STOR HEATER THERMOSTAT
AUXE	AUXILIARY ENERGY
ARHT	INTERNAL W/STORAGE
ITWS	RESISTANCE HEATER
ILWS	IN LINE W/STORAGE
ILFR	FURNACE
ILHP	HEAT PUMP
ILBR	BOILER
ILRH	RESISTANCE HEATER
ILAC	AIR CONDITIONER
ILWH	HOT WATER HEATER
IPST	IN PARALLEL W/STOR
IPFR	FURNACE
IPHP	HEAT PUMP
IPBR	BOILER
IPRH	RESISTANCE HEATER
IPAC	AIR CONDITIONER
IPDE	DEHUMIDIFIER
IPHW	HOT WATER HEATER
DIST	DISTRIBUTION
CENA	CENTRAL AIR TYPE
CSND	SINGLE DUCT
CDUD	DOUBLE DUCT
CMUL	MULTIZONE
CVAV	VAR AIR VOLUME
HYDR	HYDRONIC/AIR TYPE
HFAN	FAN COIL
HIND	INDUCTION
HRAD	RADIATION
ECON	ENERGY CONSER TYPE
EHRL	HEAT RECOVERY
EHRC	HEAT RECLAIM
EHES	ENERGY STORAGE
EHDL	DEMAND LIMITER
EHVC	VENTILATION CONT
PSYS	T SYS INTG W/BLDG
PCSA	COL/STOR ARRAY
PCPA	COVER PLATE ASSY
PINS	COL HT INSUL ASSY
PABS	ABS/THER STOR UNIT

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: HARDELEM (Continued)

PCON	CONTROLS
PACC	AIR CIR CONTROLS
PCOL	COL HT INSUL ASSY
PAUX	AUXILIARY ENERGY
PADI	INTG INTO DIST
PSEP	COMP SEP CONVN SYS
PDIS	DISTRIBUTION
PDUC	DUCTS
PDAM	DAMPERS

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: MKTPROB

A NONE
B MINOR REPAIRS
C MAJOR REPAIRS
D REPLACED MISC. PARTS
E NO MARKETING RETROFIT
F SOLAR FAILED TO MEET EXPECTATIONS
G NUMEROUS SYSTEM SHUTDOWNS
H CONTROL MALFUNCTION
I MINOR ADJUSTMENTS
J REPLACED A MAJOR PART
K OPERATIONAL FAILURE
L HOUSE SOLD FROM MODEL
M SYSTEM INOPERATIVE AT OPEN HOUSE
N INSTALLED AUXILIARY SYSTEM
O SOLD DURING CONST. NO MKTG
P PRE SOLD NO MKTG
Q HOUSE IS MODEL/TO BE SOLD LATER
R LACK OF INFO AVAILABLE
S HOUSE/BLDG OCCUPIED DURING RETROFIT
T PUBLIC UNFAMILIAR WITH SYSTEM
U INTEREST RATES TOO HIGH
Z MORE INFO IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: MKTPUBLIC

A FAVORABLE, ENTHUSIASTIC
B FAVORABLE, BUT SKEPTICAL
C HOME NOT AESTHETICALLY PLEASING
D PRICE TOO HIGH
E DONT CARE FOR DEVEL/NEIGHD
F NONE TAKEN
G POSITIVE
H NEGATIVE
I CURIOUS
J MIXED
K SKEPTICAL
L LACKED SOLAR KNOWLEDGE
M CAUTIOUS W/ COST CONCERNS
N CONCERN WITH MAINTENANCE
O HAD SOLAR KNOWLEDGE
P WANT PERFORMANCE ASSURANCE
Q WANT MORE INFORMATION
R LEERY OF SOLAR
S INTERESTED BUT MONEY NOT AVAILABLE
Z MORE INFO IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: MTCPROB

A NONE
B HUD 235 LOAN
C HUD COLLEGE HSG LOAN
D HUD LOW INCOME HSG
E RETROFIT
F LOW INCOME PUB. HSG.
G NO MORTGAGE CASH
H HOUSE RENTED/LEASED AT THIS TIME
I HUD SEC. 8 ELDERLY HOUSING
J SELF HELP HOUSING LOAN/HUD FINANCED
K NO MORTGAGE USED UNIVERSITY FUNDS
L MORTGAGE OBTAINED PRIOR TO GRANT
M GRANTEE HOLDS MORTGAGE
N INT. RATE HIGH/MONEY NOT AVAIL.
Z MORE INFO. IN FILE

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: OPERPROB

- A NO PROBLEM
- B WILL NOT ISSUE NON SOLAR CAUSE
- C PENDING COMPL. OF CONST.
- D PENDING ISSUED WHEN SOLD
- F PERMIT NOT REQ. RETROFIT
- G PERMIT NOT REQ.
- H ADD'L BLDG. MODS REQ.
- I INSPECTION VERBAL APPROVAL
- Z MORE INFO. IN FILES

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Names: SYSMFGR-A, SYSMFGR-G

ACRN ACORN STRUCTURES INC
AIRC AIR COMFORT INC
ALBQ ALBUQUERQUE WESTERN
ALSN ALL SUN POWER INC
ALIE ALLEN IRA BASS
ALHE ALTERNATIVE HEAT SYS
ASFE AMERAUS SYS/FLEETWOO
AMTH AMERICAN HELIOTHERM
ASHS AMERICAN SOLAR HEAT
ASKC AMERICAN SOLAR KING
AMSI AMERICAN SUN IND.
APOL APOLLO SOLAR SYSTEMS
ARKL ARKLA INDUSTRIES
AZTC AZTEC SOLAR CO
BDPC BDP COMPANY
BEAS BEASLEY COMPANY
BRAD BRADLEY LOREN CO
BRWN BROWN MANUFACTURING
CDVA C AND D VALVE
CJAS C J ASSOCIATES INC
CALM CALMAC MFG
CPTL CAPITAL
CARO CAROLINA SOLAR EQUIP
CASA CASAGRANDE CONST CO
CBLR CENTRAL BOILERS LTD
CHBL CHAMBERLAIN MFG
CHPN CHAMPION HOME BLDRS
COLE COLE SOLAR SYSTEMS
COLT COLT INC OF SO CAL
COLU COLUMBI CHASE SOL EN
CNSL CONSOLAR INC
CONS CONSOLIDATED WESTERN
COEN CONSUMER ENERGY CORP
CTEM CONTEMPORARY SYSTEMS
CREP CREIGHTON SOLAR CONC
CSIS CSI SOLAR SYSTEMS
DAYS DAYSTAR
EKSC E AND K SERVICE CO
ERSB EDWIN R SANDERS BLDR
ENAL ENERGY ALTERNATIVES
ENCO ENERGY CONSERV ENG
ENDY ENERGY DYNAMICS CORP
ENRG ENERGY RESEARCH GRP
ELTD ENGINEERS LTD
FASC FASCO INC
FERN FERN ENGINEERING CO

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Names: SYSMFGR-A, SYSMFGR-G (Continued)

FILN	FILON DIVISION
FLAG	FLAGALA CORP
FLET	FLETCHER MYERS
FLPR	FLOW PRODUCTS INC
FOXS	FOX STEEL CO
FRED	FRED RICE PROD
FRON	FRONTIER DEVELOPMENT
FUSY	FUTURE SYSTEMS INC
GENE	GENERAL ELECTRIC
GEDE	GENERAL ENERGY DEVIC
GNSO	GENERAL SOLARGENIC
GSUN	GENERAL SUN
GNSS	GNS SOLARWALL
GRIP	GRIEP HEATING
GRUM	GRUMMAN ENERGY SYS
GULF	GULF THERMAL
HALS	HALSUN SOLAR ENG
HEFR	HEFRON SOLAR SYSTEMS
HLIO	HELIO THERMICS
HDYN	HELIODYNE
HELP	HELIOPHASE
HTRM	HELIO THERM INC
HECL	HEX CELL
HYPE	HYPERION INC
ILSE	ILSE ENGINEERING INC
ITEC	INTERTECHNOLOGY
IENV	INTL ENVIRONMENT
ISOL	INTL SOLARTHERMICS
JACK	JACKSON
KALW	KALWALL
KENN	KENNECOTT COPPER
KENW	KENWALL CORPORATION
KTAC	KTA CORP
LARG	LARGO SOLAR SYS INC
LENX	LENNOX-HONEYWELL
LOFC	LIBBY OWENS FORD CO
MIRO	MIROMIT
NENG	NATIONAL ENERGY CORP
NESC	NATIONAL ENERGY SYST
NSOL	NATIONAL SOLAR CORP
NUTS	NATURAL ENERGY CORP
NENW	NATURAL ENERGY WKSHP
NORT	NORTHRUP
NRGL	NRG LTD
NRGM	NRG MANUFACTURING
NPTD	NTL PATENT DEVELOP

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Names: SYSMFGR-A, SYSMFGR-G (Continued)

OCON	OCON INDUSTRIES INC
OLIN	OLIN BRASS
OVER	OVERLY MANUFACTURING
OWEN	OWENS ILLINOIS
PARK	PARK ENERGY
PAYN	PAYNE AIR CONDITION
PION	PIONEER ENERGY PROD.
PIPR	PIPER HYDRO INC
PLIN	PLEIAD INDUSTRIES
PPGI	PPG INDUSTRIES
PPIE	PPG/INT ENVIR
PRSH	PRACTICAL SOLAR HEAT
RMPR	R M PRODUCTS
RALS	RALEIGH SOLAR SYSTEM
RAYP	RAYPAK
REFR	REFRIGERATION RESERC
REPC	RESEARCH PRODUCTS
REVE	REVERE
REYN	REYNOLDS
RICK	RICKER MANUFACTURING
ROCK	ROCKY MOUNTAIN PROD
ROMA	ROM-AIRE
SATL	SCIENTIFIC-ATLANTA
SEBN	SEECO BINKLEY
SMSP	SEMCO SOLAR PRODUCTS
SHAL	SHALLA CORP
SHEL	SHELDAHL
SITE	SITE BUILT
SKYT	SKYTHERM
SOFA	SOLAFERN LTD
SOHT	SOLAHART
SLAP	SOLAPAK
SACC	SOLAR ACCESS INC
SLCN	SOLAR CENTRAL
SCOM	SOLAR COMFORT INC
SDVL	SOLAR DEVELOPMENT
SDEV	SOLAR DEVICES
SELI	SOLAR ELECTRIC INTL
SENC	SOLAR ENERGY CORP
SENI	SOLAR ENERGY INC
SEPR	SOLAR ENERGY PROD
SERC	SOLAR ENERGY RESEARCH
SEST	SOLAR ENERGY STRUCT
SEEQ	SOLAR ENERGY & EQUIP
SNGY	SOLAR ENERGYTICS INC
SENG	SOLAR ENGINEERING

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Names: SYSMFGR-A, SYSMFGR-G (Continued)

SENT SOLAR ENTERPRISES
SFRM SOLAR FARMS
SLHC SOLAR HEAT CORP
SLHT SOLAR HEAT INC
SHST SOLAR HEATING SYST
SHOM SOLAR HOMES INC
SHSG SOLAR HOUSING INC
SLHY SOLAR HYDRO INC
SINC SOLAR INC
SIOF SOLAR IND OF FLORIDA
SINN SOLAR INNOVATIONS
SLKN SOLAR KINETICS CORP
SKIN SOLAR KING
SMFG SOLAR MANUFACTURING
SOLI SOLAR ONE
SPAS SOLAR PACKAGE STRUCT
SPST SOLAR PROD SUN TANK
SORE SOLAR RESEARCH
SLRM SOLAR ROOM CO
SSEV SOLAR SEVEN IND
SSHL SOLAR SHELTER
SSTR SOLAR STOR
SUNS SOLAR SUN
SSVA SOLAR SYST OF VA
SSSD SOLAR SYST SUNDANCE
SSEN SOLAR SYSTEM ENTERP.
SSII SOLAR SYSTEMS INT
SOTH SOLAR THERM
SOUL SOLAR UNLIMITED INC
SOLA SOLARA
SRAY SOLARAY
SCEL SOLARCELL
SCOA SOLARCOA INC
SLIN SOLAREIN
SGEN SOLARGENICS
SRIS SOLARIS
SLMR SOLARMASTER
SMAT SOLARMATIC
SROL SOLAROLL
SRON SOLARON
SOTC SOLARTEC
SOTR SOLARTRONICS INC
SAIR SOLAR-AIRE
SLRA SOLA-RAY
SOLC SOLCAN
SRGY SOLERGY INC

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Names: SYSMFGR-A, SYSMFGR-G (Continued)

SLOP SOLOP CORP
SOLP SOLPOWER INDUSTRIES
SOLW SOLWIN INDUSTRIES
SWET SOUTH WEST ENER-TECH
SPEC SPECTRA ENERGY SYS
SRWI SRW INC
SSSI SS SOLAR INC
SSPA SSP ASSOC
SSCO STANDARD SOLAR COLL
STIN STATE INDUSTRIES
STOR STORAGE ONLY
SCFT SUN CRAFT
SUDS SUN DESIGN
SNFL SUN FLOW
SHAR SUN HARVESTER CORP
SUPC SUN PAC
SUPO SUN POWER CORP
SPIN SUN POWER INDUSTRIES
SPSY SUN POWER SYSTEMS
SURE SUN RAY SOLAR EQUIP
SSYS SUN SYSTEMS INC
SNBL SUNBLAZER SOLAR FURN
SBUR SUNBURST
SNLL SUNCCELL
SEAR SUNEARTH
SPOW SUNENERGY POWER LTD
SUFO SUNFLOWER SOLAR INC
SLPO SUNLIGHT & POWER CO
SUMA SUNMASTER CORP.
SNSV SUNSAV INC
SNSR SUNSAVER
SNUT SUNSHINE UTILITY CO
SSTN SUNSTONE
SNST SUNSTREAM
SNTP SUNTAP INC
SUNW SUNWALL INC
SWAT SUNWATER
SWOR SUNWORKS
SUHE SUN-HEET
TREK TECHNITREK CORP
TESO TELLURIDE SOLAR WORK
TECH THERMAL TECH
TOMS THOMASON
TRAN TRANTER
TRSI TRITEC SOLAR INDUSTR
UNCO UNION CO CORRECTIONL

APPENDIX C

CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Names: SYSMFGR-A, SYSMFGR-G (Continued)

USSC UNITED STATES SOLAR
UNSP UNSPECIFIED
USIN US INSTALLATIONS
VEST VALMONT ENERGY SYSTE
WEAT WEATHER KING
WEST WESTERN ENERGY INC
WSDI WESTERN SOLAR DEVEL
WHIT WHITE LINE INC
WILX WILCOX MFG & DISTR
WILC WILSON CORPORATION
WYSO WYOMING SOLAR
YING YING MANUFACTURING
ZIEN ZIEN
ZORK ZOMEWORKS
ZZZZ ZZZZZZ - END OF LIST

APPENDIX C
CODES/VALUES FOR CERTAIN DATA ELEMENTS (Continued)

Data Element Name: ZONPROB

- A NO PROBLEM
- B DOES NOT CONFORM SOLAR CAUSE
- C DOES NOT CONFORM NON SOLAR CAUSE
- D "SUN RIGHTS"
- F PERMIT NOT REQ. RETROFIT
- G PERMIT NOT REQ.
- H ADD'L BLDG. MODS REQ.
- I PREVIOUSLY ZONED
- Z MORE INFO. IN FILES

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10. SUPPLEMENTARY NOTES <input type="checkbox"/> Document describes a computer program; SF-185, FIPS Software Summary, is attached.			
11. ABSTRACT <i>(A 200-word or less factual summary of most significant information. If document includes a significant bibliography or literature survey, mention it here)</i> The Residential Solar Data Center project staff in the Center for Building Technology, National Bureau of Standards, maintains a computerized data base containing non-instrumented residential data from the DoE/HUD Solar Heating and Cooling Demonstration Program. This document provides a dictionary of data elements collected as part of the Residential Solar Program and a directory of the specific files which contain the data elements. This data dictionary/directory was produced by a computer program written in ASCII COBOL. The automated procedure is briefly described in an appendix.			
12. KEY WORDS <i>(Six to twelve entries; alphabetical order; capitalize only proper names; and separate key words by semicolons)</i> Automatic data processing; data dictionary/directory; residential buildings; solar data; solar energy system; solar heating and cooling.			
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